TEXAS TECHNOLOGICAL
1948
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the OIL AND GAS JOURNAL

"WHEN YOU USE HUGHES
PRODUCTS YOU GET
PERFORMANCE WITH
A BIG PLUS"
"Recently one of the Hughes men worked out a 'planned bit program,' on three wells, for me . . spotting bits in certain formations. I was amazed at the result. In each instance there was a marked decrease in lapsed drilling days and bits per well. That's what I call service beyond the call of duty and it surely fits right in with that old Hughes slogan, an 'Engineered Solution' for every drilling problem."
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LUBBOCK, TEXAS
HUGHES TOOL COMPANY
HOUSTON, TEXAS
Standard of the Industry

PRICE 20 CENTS

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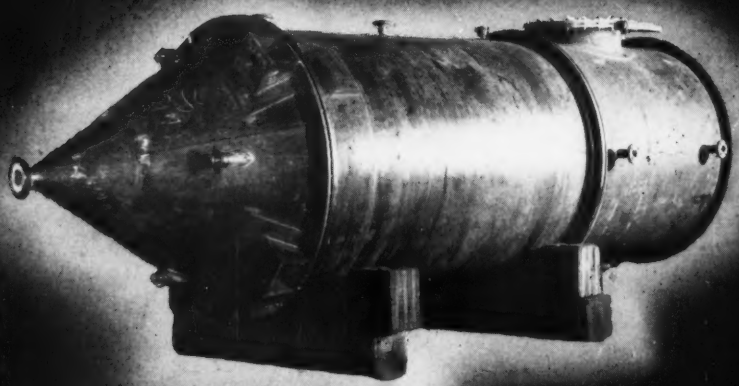
JULY 1, 1948

Wyatt's

SUPERIOR FABRICATION FOR THE CHEMICAL INDUSTRY



A large nickel-clad evaporator, typical of the many special products fabricated by Wyatt for the rapidly expanding Chemical Process Industry.

Experience is combined with modern methods and equipment at Wyatt's to attain perfection in stainless lined, stainless clad or stainless steel fabricating for modern industry.

WYATT METAL & BOILER WORKS

Wyatt's

HOUSTON - DALLAS

JULY

A name to remember when you need Storage Tanks

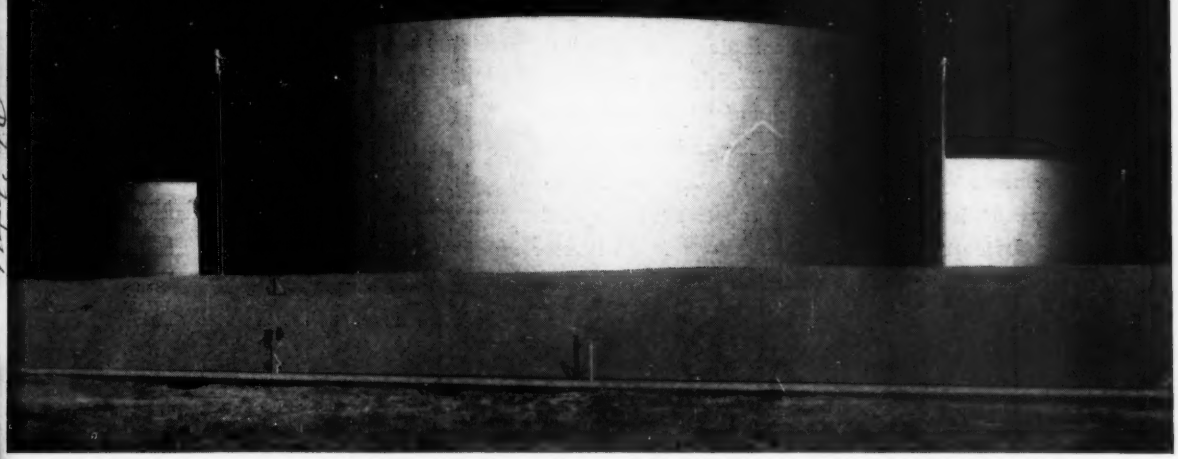
BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

FABRICATED STEEL CONSTRUCTION

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation



BENDIX-SCINTILLA

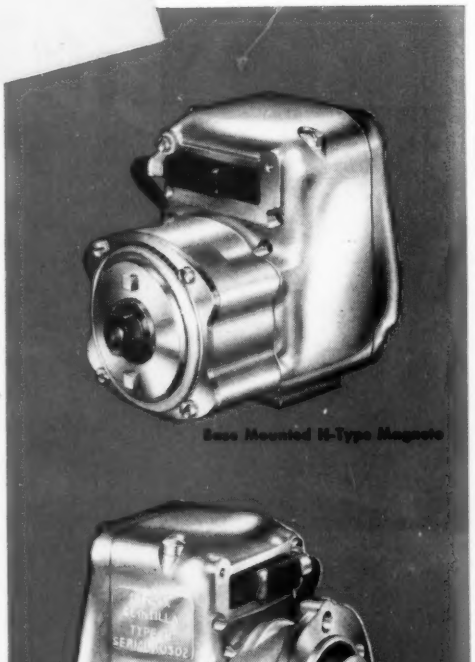
presents a new

H-TYPE MAGNETO

for single cylinder engines

Every Feature You Ever Asked For

- Waterproof, high-tension outlet
- Higher voltage at starting speeds
- Constant spark over entire speed range
- Equipped with impulse coupling
- Flange or base mounting
- Fully enclosed . . . dust- and moisture-proof design
- Sturdy and compact construction
- Crankshaft speed, single cylinder installation
- Waterproof "Plasticoil"
- Metal cover



Base Mounted H-Type Magneto

Flange Mounted H-Type Magneto

For Commercial, Industrial and Marine Applications

Bendix-Scintilla, long famous for ignition equipment precision-built to the exacting specifications of the aviation industry, now brings you these same high standards of quality and efficiency in a new H-Type Magneto for single cylinder engines. This unit has been developed by Bendix-Scintilla engineers, after extensive study of the field, as a completely new magneto —with new design features—new sure-fire performance. For the improvements you expect, specify Bendix-Scintilla* H-Type Magnetos, backed by years of experience in dependable ignition for every type of engine. Ask your distributor or write the factory for full specifications and information.

*TRADE MARK

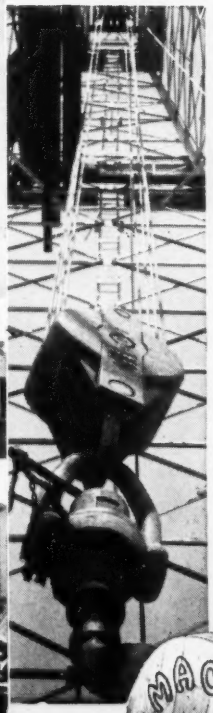
BENDIX SCINTILLA

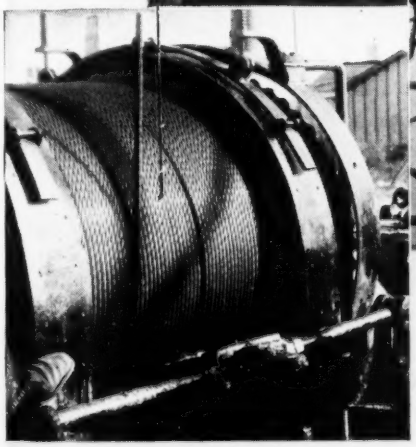
SCINTILLA MAGNETO DIVISION of Bendix AVIATION CORPORATION

SIDNEY, NEW YORK

Macwhyte PREformed Rotary Lines

Correct for your drilling equipment





For maximum safety, service, dependability, use Macwhyte PREformed Monarch Whyte Strand Rotary Lines.

It's PREformed for flexibility, easy handling and maximum service. It runs smoothly through blocks and spools evenly on drum.

Internal Lubrication covers every wire in the line . . . protecting unseen inside wires. Monarch Whyte Strand PREformed Rotary Lines are available in the size and length you need. Macwhyte Distributors and Mill Depots — carry stocks for immediate delivery. Macwhyte representatives will recommend the correct line for your equipment.

MACWHYTE COMPANY

2916 Fourteenth Avenue · Kenosha, Wisconsin

Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.

Mill Depots: New York · Pittsburgh · Chicago Minneapolis · Fort Worth · Portland · Seattle San Francisco · Los Angeles

Distributors throughout the U. S. A. and other countries.

947-O

Other Macwhyte Wire Lines for the oil industry:

Cable Tool Lines
"Hi-Lastic" Lines
Casing, Tubing Lines
Winch Lines
Sand, Bailing Lines
Braided Wire Rope Slings
Monel Metal and Stainless Steel Wire Ropes

●Standard Oil of Indiana officials and the company-owned Beechcraft Executive Transport (left to right) Mr. J.K Roberts, General Manager of Research, and Mr. J. W. Ross, Assistant General Manager of Sales.

Things can't happen too fast for a Beechcraft

Beechcraft twin-engined Transports are part of the history of the nation's widespread enterprise in oil. For their daily use by leading drillers, producers and distributors has long provided not only fast, economical transportation for the industry but the mobility needed to get there quickly when things happen fast.

The Beechcraft is a superbly comfortable way to travel. It operates in and out of small as well as large airports—at highest standards of efficiency and safety. Operating costs are surprisingly low.

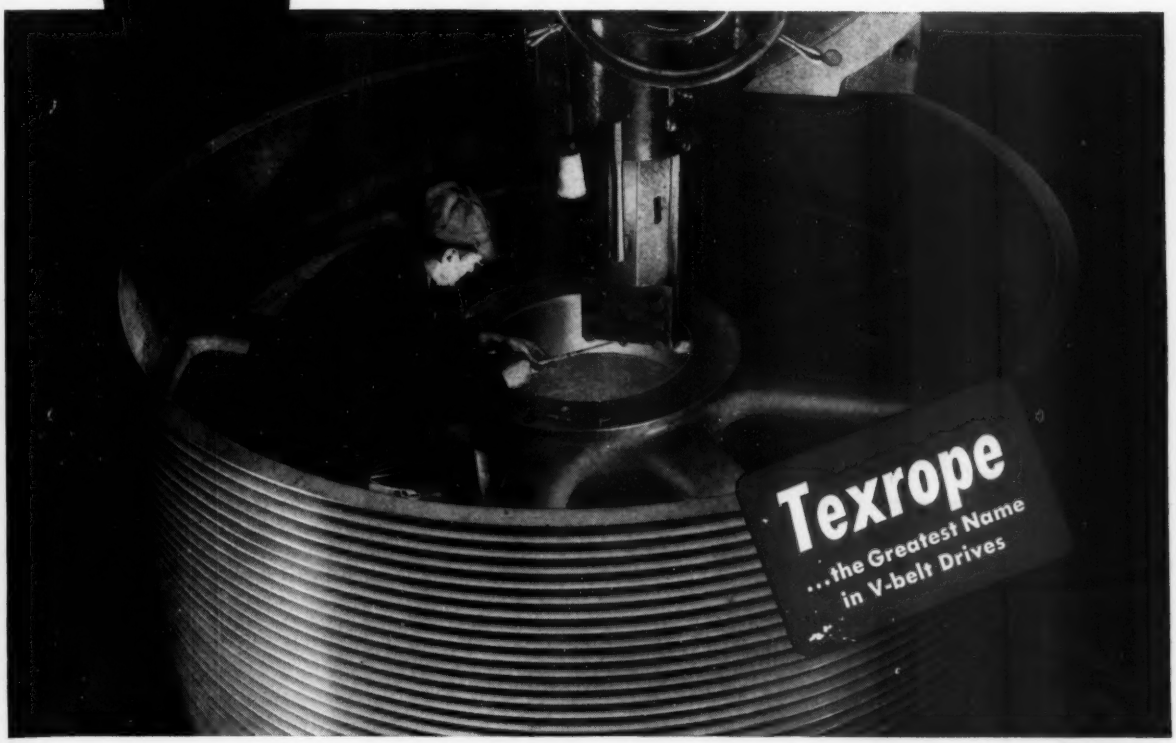
● A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business," with full details on the 200 mile-per-hour Executive Transport. Write today to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

BEECHCRAFT
EXECUTIVE TRANSPORT
MODEL 18

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1948.

5.4 or 108 inch . . . every *Magic-Grip* Sheave is "Easy On . . . Easy Off!"



Largest Ever Built! This specially-built 108 inch *Magic-Grip* sheave was ordered for the same reason that thousands of smaller stock sheaves are ordered. It comes completely assembled . . . goes on the shaft without a struggle . . . grips like a vise . . . and is just as easily removed! Stock *Magic-Grip* sheaves from 1 to 250 hp are available through your nearest Allis-Chalmers dealer or district office.

Get Magic-Grip Sheaves In "Pre-Engineered" Drives

New 144-page "Pre-Engineered" *Texrope* drive manual lists 22,000 economical stock drives from 1 to 150 hp — meets 90% of all V-belt drive requirements. Ask for Bulletin 20B6956. ALLIS-CHALMERS, MILWAUKEE. *Texrope, Super-7, Texsteel, Texdrive, Magic-Grip* and *Vari-Pitch* are Allis-Chalmers trademarks. A 2430

A Complete Range of Products

Super-7 V-belts	5 types . . . sizes to suit every power transmission job
Texsteel, Texdrive, Magic-Grip	Sheaves in a full range of sizes and grooves
Vari-Pitch Sheaves	Exact variations in speed — Stationary or Motion control
Speed Variators	Speed variations up to 375% at the turn of a crank

Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices.

ALLIS-CHALMERS

Originators of the Multiple V-belt Drive for Industry

Can You Use This Versatile, Economical Catalyst?

BORON FLUORIDE ETHERATE

Alkylated Phenols
Paints & Varnishes
Gums
Bodied Oils
High Octane Gasolines
Resins
Esters
Intermediates

Boron Fluoride Etherate is an unusually versatile liquid catalyst, offering multiple advantages and economies for a wide range of reactions, including polymerization, alkylation, arylation, condensation, isomerization, esterification, cyclization. It combines the catalytic properties of BF_3 with the ease of handling and exact dispensability of a liquid. In operation after operation it has proved superior to many other catalysts because:

- Smaller quantities have greater catalytic activity.
- Little or no extraneous material is introduced into the system.
- Reactions are moderated or more easily controlled.
- Operating temperature ranges are wider.
- Yields are increased.
- Separations are easier and no bulky sludges are formed.
- Properties of end-products are improved.
- More reactions are carried to completion.
- Fewer undesirable waste materials result.

Boron Fluoride Etherate is available in 5-, 20- and 55-gallon drums for commercial applications as well as in one- and five-pound bottles for research purposes. For experimental samples and list of technical references on uses, etc., please make request on business letterhead.

Possible Uses of BORON FLUORIDE Etherate as Catalyst for:

1 Polymerization and co-polymerization of mixed unsaturates.

2 Selective esterification of mixtures of organic acids.

3 Cyclization of synthetic and natural elastomers after polymerization or in starting from monomers.

4 Condensation of modified phenolics.

5 Preparation of alkyl phenols.

6 Refining of aromatic and paraffinic solvents by polymerization of the olefins they contain.

7 Increasing viscosity of semi-drying and drying oils.

8 Modification of mixtures of esters and acids by polymerizing conjugated compounds selectively.

OTHER BF_3 CATALYSTS: Fully equipped to handle gaseous BF_3 in producing its compounds with other complex-forming chemicals, Baker & Adamson is ready to work with you in the development of BF_3 catalysts to meet your specifications. This is of special significance since BF_3 can often be coordinated with products entering into the reactions in which it is the active catalyst.

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STANDARD OF PURITY
FINE CHEMICALS

BAKER & ADAMSON *Fine Chemicals*
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
Offices from Coast to Coast

Get it from CRANE . . .
for quality in every piping item

It's as simple as that! *Everything* from Crane is the easy way to specify "Quality" in all piping equipment. Whether it's valves, fittings, accessories or fabricated piping . . . one catalog and one order quickly bring everything you need from your nearest Crane Branch.

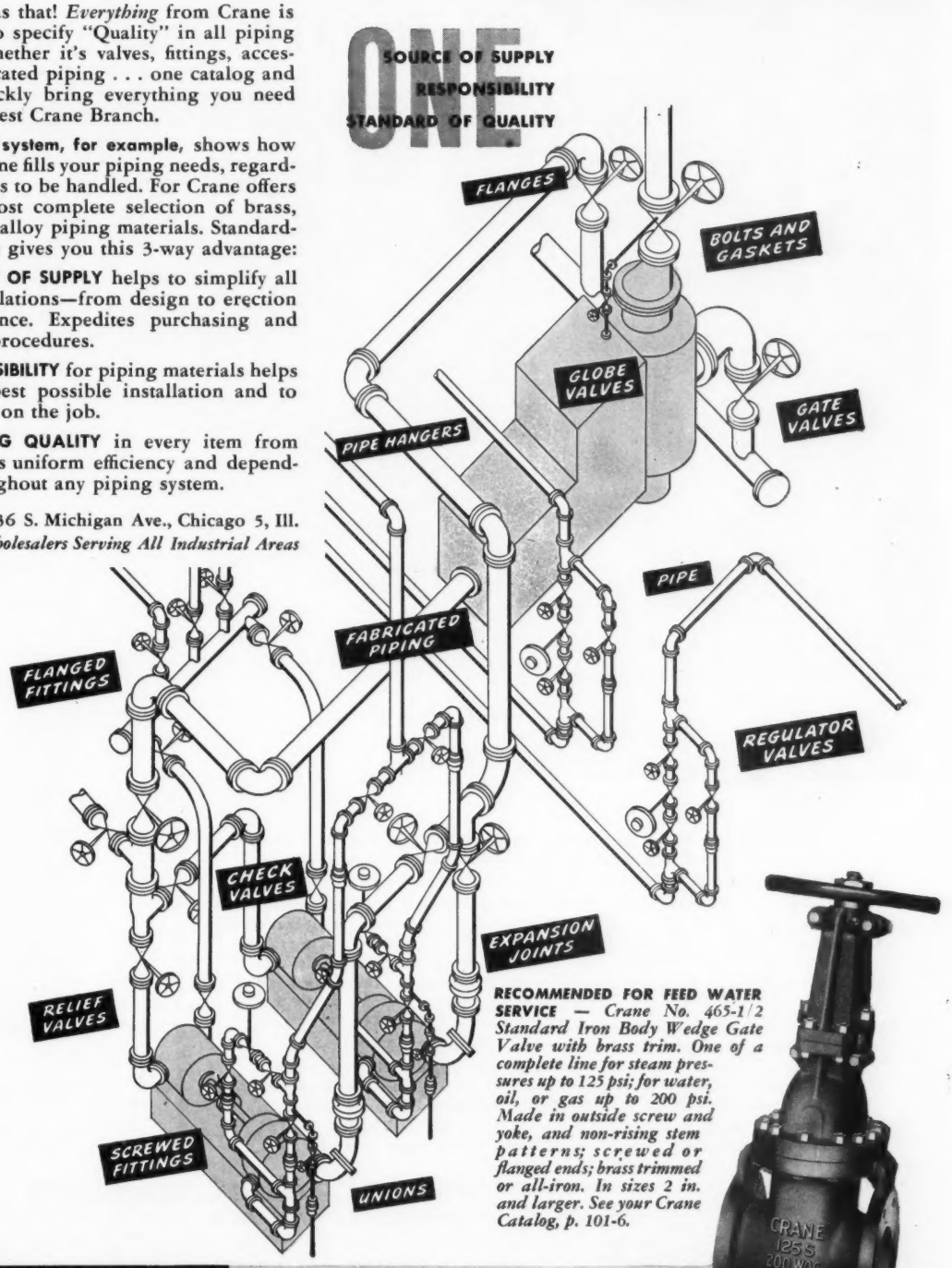
This boiler feed system, for example, shows how completely Crane fills your piping needs, regardless of the fluids to be handled. For Crane offers the world's most complete selection of brass, iron, steel and alloy piping materials. Standardizing on Crane gives you this 3-way advantage:

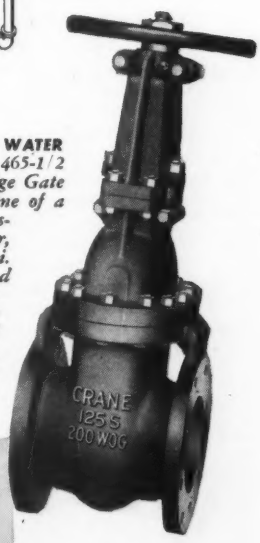
ONE SOURCE OF SUPPLY helps to simplify all piping installations—from design to erection to maintenance. Expedites purchasing and store-room procedures.

ONE RESPONSIBILITY for piping materials helps to get the best possible installation and to avoid delays on the job.

OUTSTANDING QUALITY in every item from Crane assures uniform efficiency and dependability throughout any piping system.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas





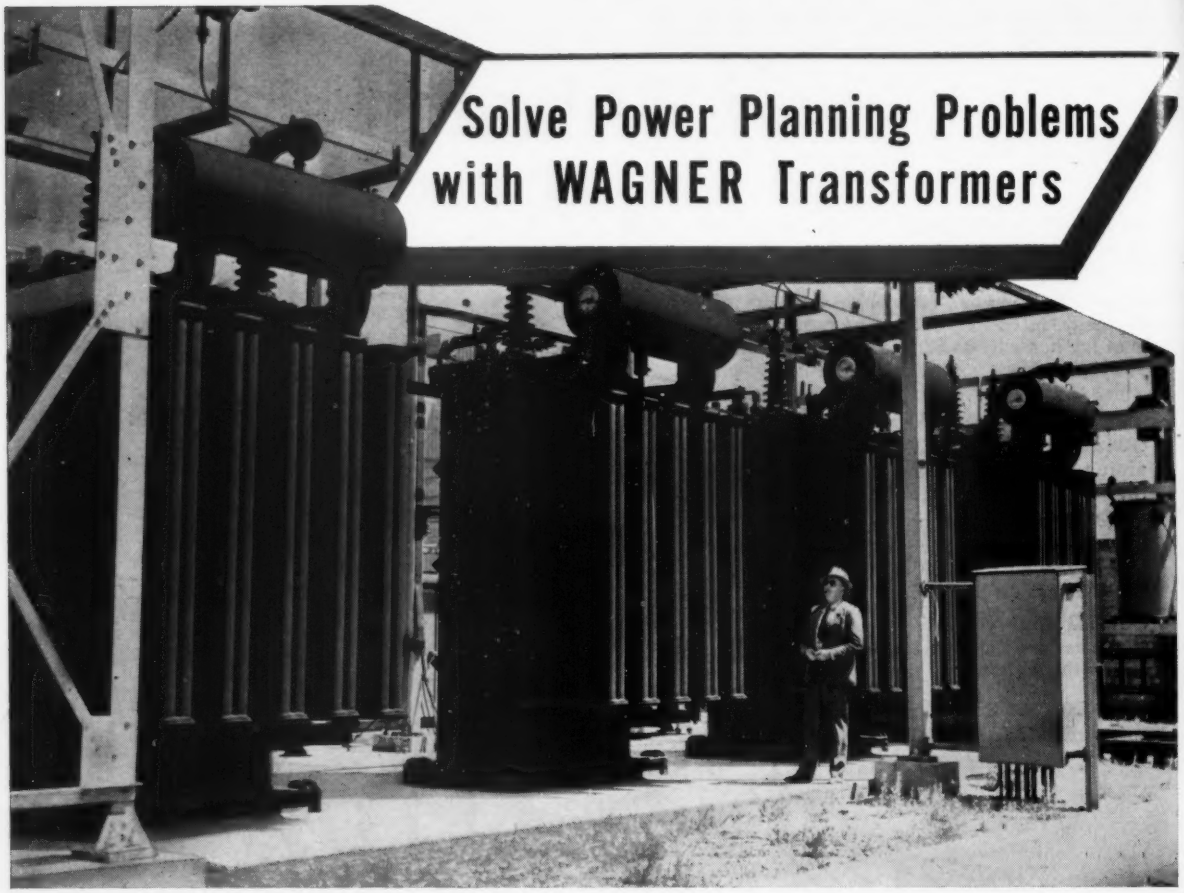
RECOMMENDED FOR FEED WATER SERVICE — *Crane No. 465-1/2 Standard Iron Body Wedge Gate Valve with brass trim. One of a complete line for steam pressures up to 125 psi; for water, oil, or gas up to 200 psi. Made in outside screw and yoke, and non-rising stem patterns; screwed or flanged ends; brass trimmed or all-iron. In sizes 2 in. and larger. See your Crane Catalog, p. 101-6.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM



Solve Power Planning Problems with WAGNER Transformers

GET ADDED SAFETY... ADDED ECONOMY... ADDED SERVICE!

This bank of power transformers, installed in a large aircraft plant in the Southwest, is typical of Wagner transformer installations for industrial power systems.

Wagner Power Transformers have established enviable records for continuous service in thousands of industrial plants and on transmission lines from coast to coast. Carefully controlled production methods, highest quality materials, rigid inspection and tests, and more than fifty-five years of transformer engineering experience mean that you can count on Wagner Transformers for dependable performance, plus added safety . . . added economy . . . and added service.

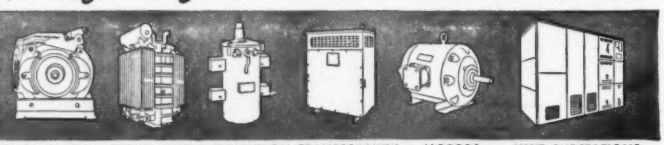
Users of power transformers will find it to their advantage to consult Wagner engineers on all of their transformer requirements. Wagner transformer users also profit by speedy, nationwide service facilities. Twenty-nine branch offices, manned by trained field engineers, are ready to serve you. Write for Bulletins TU-180 and TU-181 for information on the complete line of Wagner Transformers.

In addition to power transformers, Wagner can furnish Rural-Line, Distribution and Substation Transformers—all sizes and types.

Wagner Electric Corporation
6389 PLYMOUTH AVENUE, ST. LOUIS 14, MO.

Consult Wagner Engineers on All Transformer Problems

Wagner Electric Corporation
EST. WE 1891



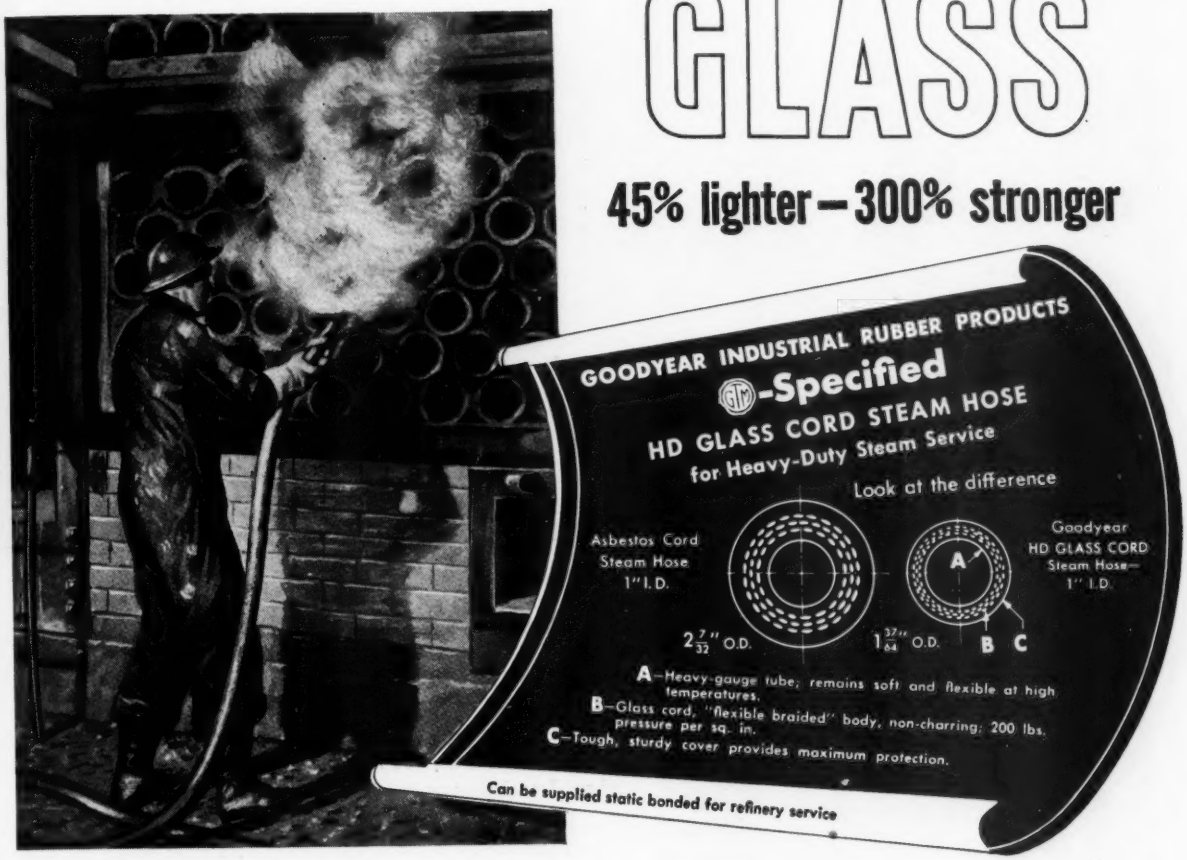
BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

ELECTRICAL AND AUTOMOTIVE PRODUCTS

T48-11

NOW STEAM HOSE built with GLASS

45% lighter—300% stronger


GOODYEAR INDUSTRIAL RUBBER PRODUCTS
GTM-Specified
HD GLASS CORD STEAM HOSE
for Heavy-Duty Steam Service
Look at the difference
Asbestos Cord Steam Hose 1" I.D.
2 7/32" O.D.
A
1 37/64" O.D.
B C
Goodyear HD GLASS CORD Steam Hose— 1" I.D.
A—Heavy-gauge tube; remains soft and flexible at high temperatures.
B—Glass cord, "flexible braided" body, non-charring; 200 lbs. pressure per sq. in.
C—Tough, sturdy cover provides maximum protection.
Can be supplied static bonded for refinery service

Proved in service — now after more than a year of rigorous field tests Goodyear announces a revolutionary new type of steam hose that sets a new high in flexibility, ease of handling and long life. It is sinewed with *glass* fiber cord — a new development spun from silk-like filaments of glass, far superior to conventional materials in strength and heat resistance. The result is the finest hose ever offered for still flue-cleaning service, fire fighting and other high-pressure steam uses.

What it does — this new Goodyear HD GLASS Cord Steam Hose has proved its ability to carry 200 pounds saturated steam pressure at 388° F. for more than 300 hours under constant flexing. If flexion is slight or use intermittent it will give far longer service. In field use it has lasted months where the best previous hose burst in weeks.

Compare these facts—size for size, this new Goodyear HD GLASS Cord Hose averages 45% less weight and 50% thinner wall gauge than former "Beefed-up" types of asbestos cord hose — *yet it is 300% stronger!* The secret is the glass cord's higher tensile strength and an exclusive new Goodyear "flexible-braided" body construction that gives far greater adhesion, more brawn with less bulk.

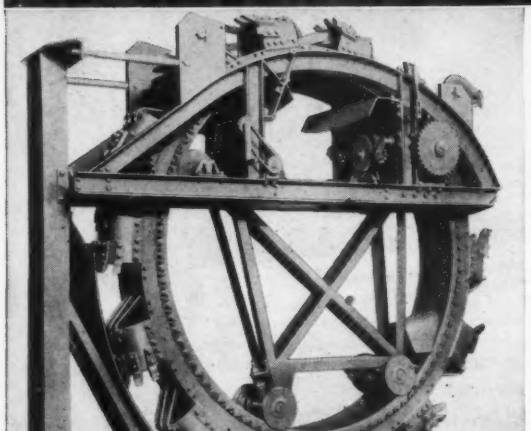
How to order — see the G.T.M. — Goodyear Technical Man. Or phone your nearest Goodyear Industrial Rubber Products Distributor, local headquarters for hose, belting, molded goods, packing and tank lining built to the world's highest quality standard.

GOODYEAR

THE GREATEST NAME IN RUBBER

1898 GOODYEAR 50 ANNIVERSARY 1948

For TOP SPEED... on trenching



Crumber attachment and leveling shoe pick up and return fines to bucket line . . . sweep trench bottom clean, ready for pipe. Standard on 200 pipeline Trenchliner. Note, too, how heavy-duty wheel frame firmly supports digging wheel and spoil conveyor. Strong steel channels and angles make frame resistant against distortion.

Parsons WHEEL TRENCHLINER*

You can set a fast pace for your pipe gang with a Parsons 200 wheel Trenchliner on the job. It digs as fast as 20' per minute . . . trenches 15" to 26" wide, up to 5'-6" deep . . . delivers clean, smooth-walled, round-bottomed trenches ready for pipe without extra cost of hand trimming.

Production stays high, costs low, because this pipeline Trenchliner is built big and rugged in every detail. Heavy-duty wheel is held firmly at bottom, where digging pressure is greatest . . . arched wheel frame rigidly supports both digging wheel and conveyor, keeps wheel precision-aligned for accurate grading. Main operating gears are fully enclosed . . . run in continuous oil baths . . . give you longer, trouble-free service.

Parsons Trenchliners are also available in 3 other heavy-duty sizes. Let your Parsons distributor show you what one of these big production Trenchliners can do for you. In Texas see ALAMO IRON WORKS, San Antonio . . . BARTHOLOW MACH. CO., Dallas . . . GOODMAN BROS., Midland . . . F. S. RAY CO., Houston. In Oklahoma see CLARENCE L. BOYD CO., Tulsa and Guthrie. You'll find Parsons distributors in all other major oil field centers, as well.

*Trademark Reg. U. S. Pat. Off. KP827

PARSONS HEAVY DUTY

The PARSONS COMPANY
Newton, Iowa
Koehring Subsidiary

and TOP MOBILITY on heavy lifts

Koehring TRUCK CRANES

Where you have heavy lifting jobs of short duration, scattered over a wide area, you can get top mobility with Koehring truck-mounted cranes. They roll between jobs at speeds up to 35 MPH . . . with no time lost for trailer mounting. Wide range of working and traveling speeds is also an important time-saver when moving on the job with a load.

You get plenty of stability to handle bigger lifts safely because they're built heavy and tough throughout to meet rugged oil field service. Ease of operation gives you top performance every shift. Ready accessibility of all machinery simplifies maintenance, means less down-time, more work-time.

Simple convertibility from crane to shovel, pull shovel, dragline, clamshell or pile driver extends the speed, mobility and economies to all your materials-handling jobs. Let your Koehring distributor show you how. In Texas it's ALAMO IRON WORKS, San Antonio . . . BARTHOLOW MACH. CO., Dallas . . . GOODMAN BROS., Midland . . . F. S. RAY CO., Houston. In Oklahoma see CLARENCE L. BOYD CO., Tulsa and Guthrie. You'll find Koehring distributors in all other major oil field centers ready to serve you, as well.

A size to suit every job:

Koehring 205 — Shovel, Pull Shovel — ½ yard Crane Lifting Capacities: Crawlers: 13,800 lbs. Truck: 20,000 lbs.

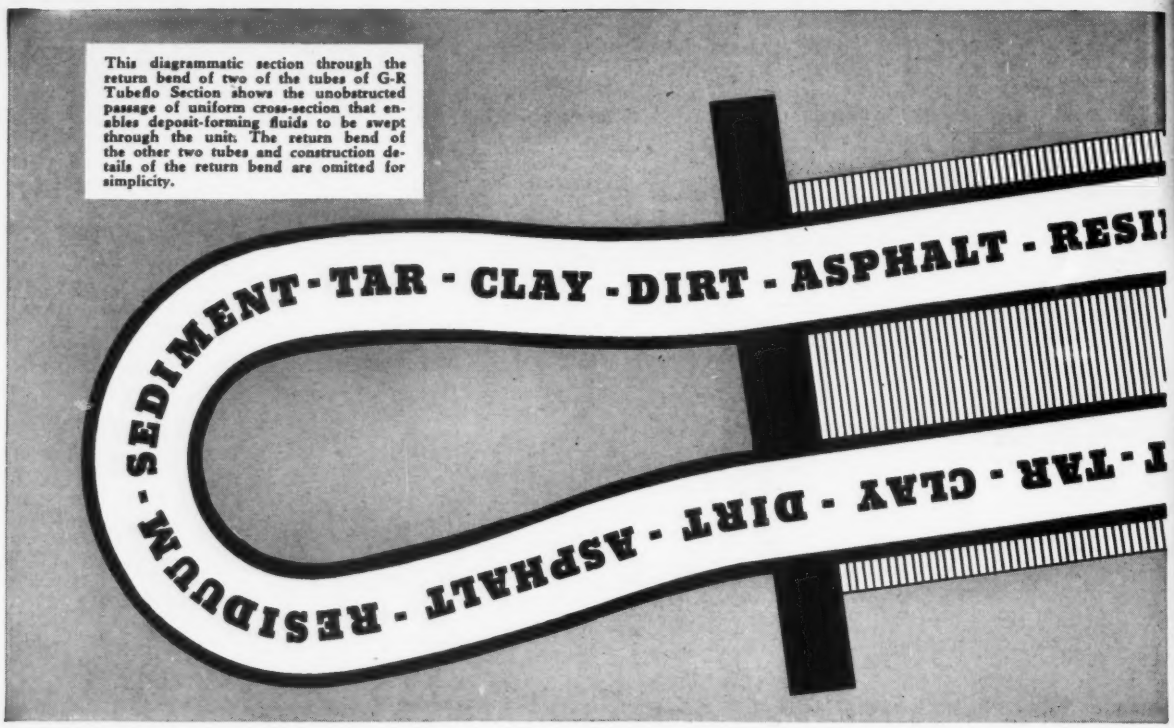
Koehring 304 — Shovel, Pull Shovel — ¾ yard Crane Lifting Capacities: Crawlers: 23,100 lbs. Truck: 40,000 lbs.

Koehring 605 — Shovel, Pull Shovel — 1½ yard Crane Lifting Capacity: Crawlers: 60,760 lbs.

Crawlers: 75% Rating — Truck: 85% Rating.

KOEHRING HEAVY DUTY

KOEHRING COMPANY
Milwaukee 10, Wis.
Subsidiaries: JOHNSON • KWIK-MIX • PARSONS



This diagrammatic section through the return bend of two of the tubes of G-R Tubeflo Section shows the unobstructed passage of uniform cross-section that enables deposit-forming fluids to be swept through the unit. The return bend of the other two tubes and construction details of the return bend are omitted for simplicity.

Can All Be Handled Without Difficulty By the G-R TUBEFLO SECTION

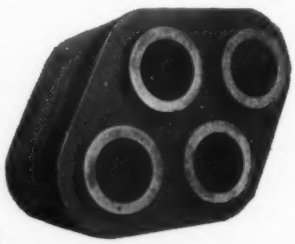
Here is a heater . . . cooler . . . exchanger . . . steam generator . . . that enables you to recover heat from *any* dirty or heavy fluid without fouling. The G-R Tubeflo Section is superior to all other designs of heat transfer apparatus for this type of service because it has a single tube per pass, with no pockets or dead ends; and provides continuous high velocity of fluids through passages of uniform cross-sectional area.

In many installations these units are maintaining initial capacity indefinitely on services which had previously necessitated shut-down and cleaning of shell-and-tube exchangers before the end of a single run.

And this exclusive feature is only one of many advantages of the G-R Tubeflo Section. Your inquiry is invited.

•

In the G-R Tubeflo Section each fluid flows through two parallel tubes arranged in two passes. The four tubes of the Section are expanded into closely-spaced diamond-shaped fins which bind the four tubes together and transfer the heat from the hot tubes to the cold tubes. All pipe connections are at one end of the unit, and the return end of the unit floats freely on change in in temperature.



THE GRISCOM-RUSSELL CO. • 285 MADISON AVENUE, NEW YORK 17, N. Y.

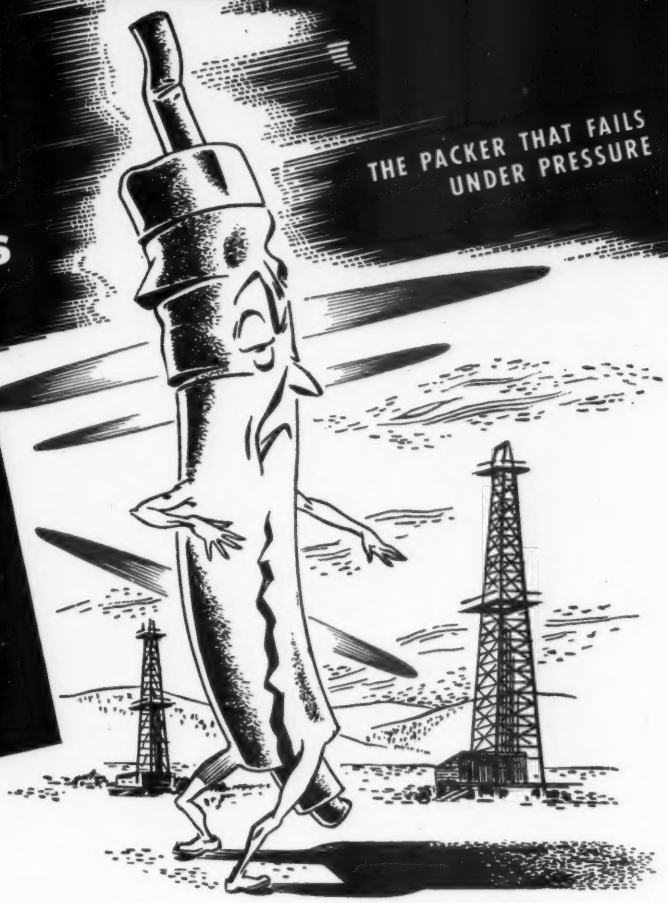
GR 202

GRISCOM-RUSSELL

Pioneers in Heat Transfer Apparatus

NIGHTMARES

that don't happen when you use LANE-WELLS PACKERS



LANE-WELLS PACKERS

have been tested to 7000 P. S. I. and 300° F.

Even if you don't have to ask your packers to take that punishment, it's good to know they can take it. And Lane-Wells Packers *can* take it, thanks to FLOSEAL Packing Rings. Made of a special synthetic which is highly resistant to all destructive down-hole influences, FLOSEAL Packing Rings give positive pack-off under the toughest conditions, yet release easily without sticking, swelling or vulcanizing. That's one big reason so many operators use nothing but Lane-Wells Packers.

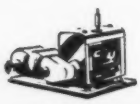
Lane-Wells makes packers to meet every need—valve or valveless, anchor or hookwall, production or testing.

OPERATORS WHO USE LANE-WELLS PACKERS

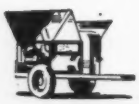
LANE-WELLS

POWER
365 DAYS IN THE YEAR

There is a complete line of Red Seal oil field engines from 1½ h.p. portable Multi-Tool, to 110 h.p., for operation on all commonly-used fuels.


WINCHES

PUMPS


WELDERS

TRUCKS

46 YEARS' SPECIALIZED EXPERIENCE BUILDING ENGINES FOR TRANSPORTATION, INDUSTRY, AVIATION, AND THE FARM.

Red Seal oil field engines are designed and built to meet the specialized requirements of the industry. These heavy-duty post war power units are real luggers for work. Such exclusive Continental features as Individual Porting cut maintenance to a minimum, lengthen the time between major overhauls, and bring efficiency and dependability to a new high.

Your Red Seal dealer is part of a strong national parts and service network. Write for literature on Continental oil field engines, and your nearby Red Seal dealer's name.

Continental Motors Corporation

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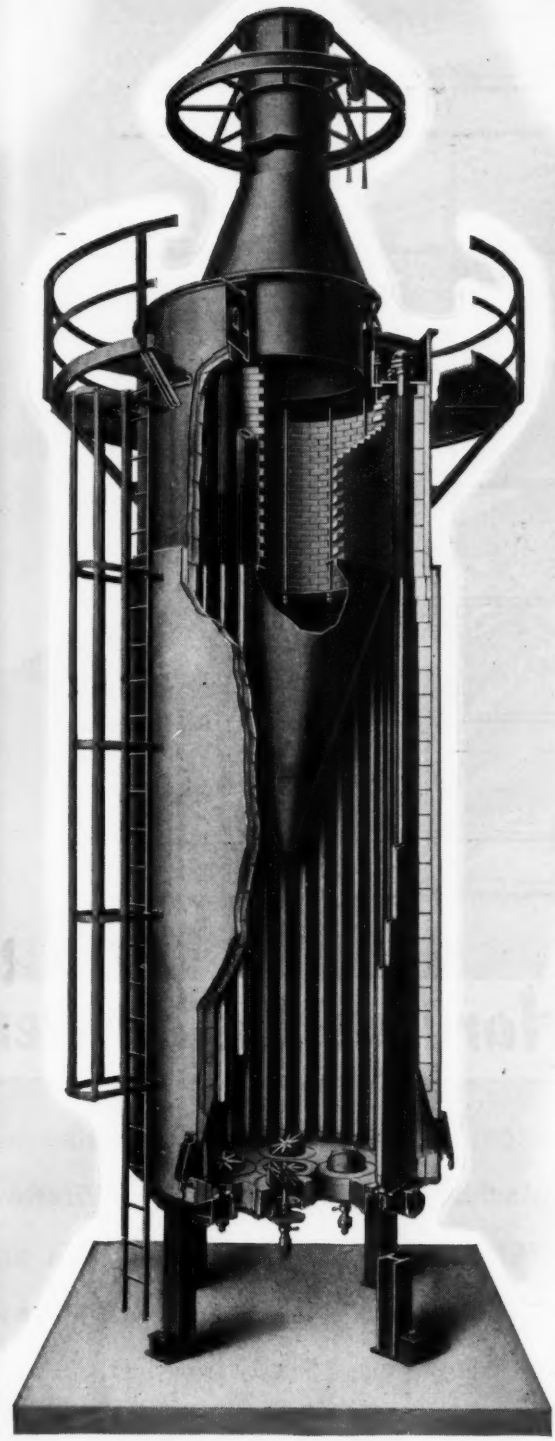
6218 Cedar Springs Road, Dallas 1, Texas



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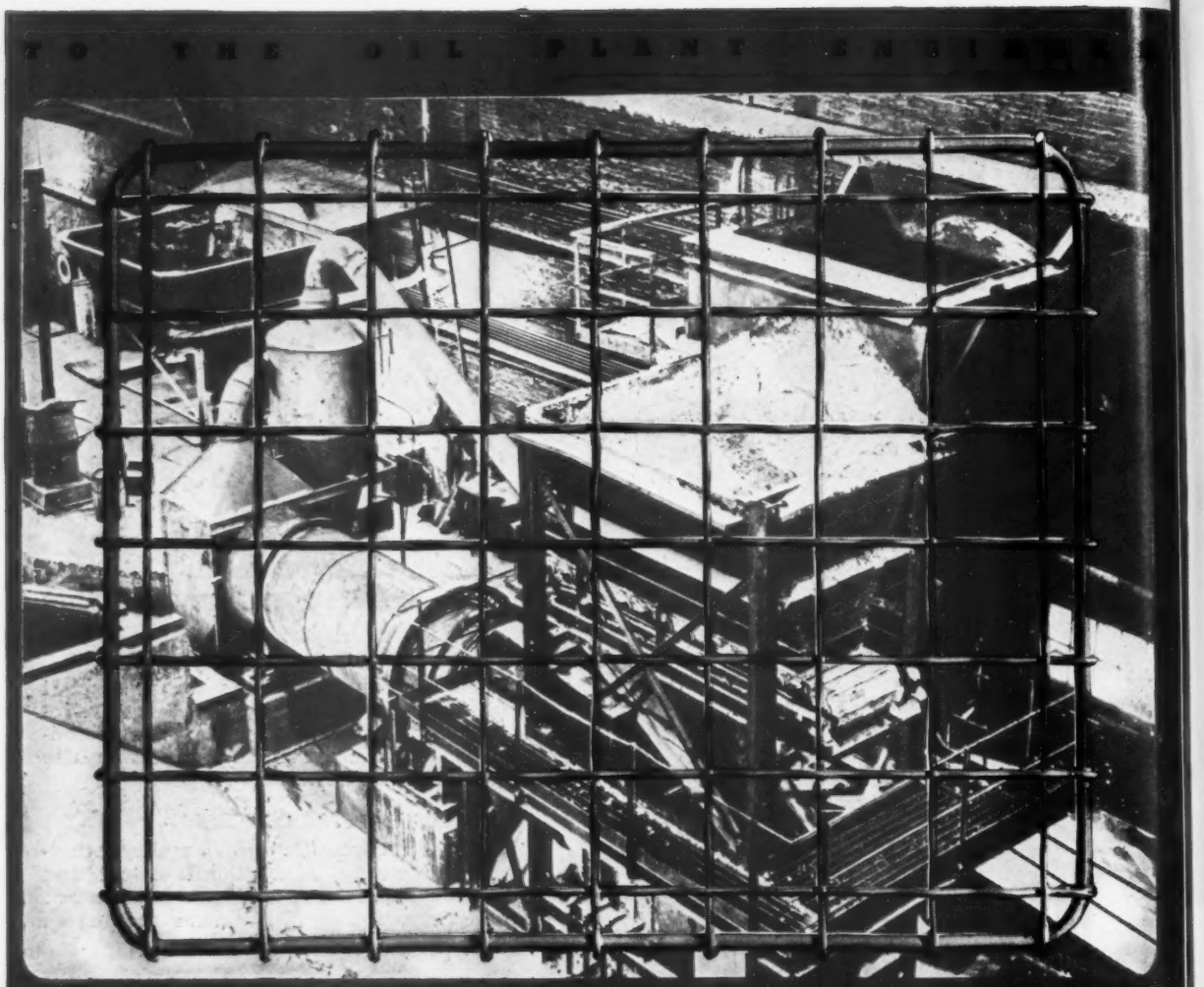

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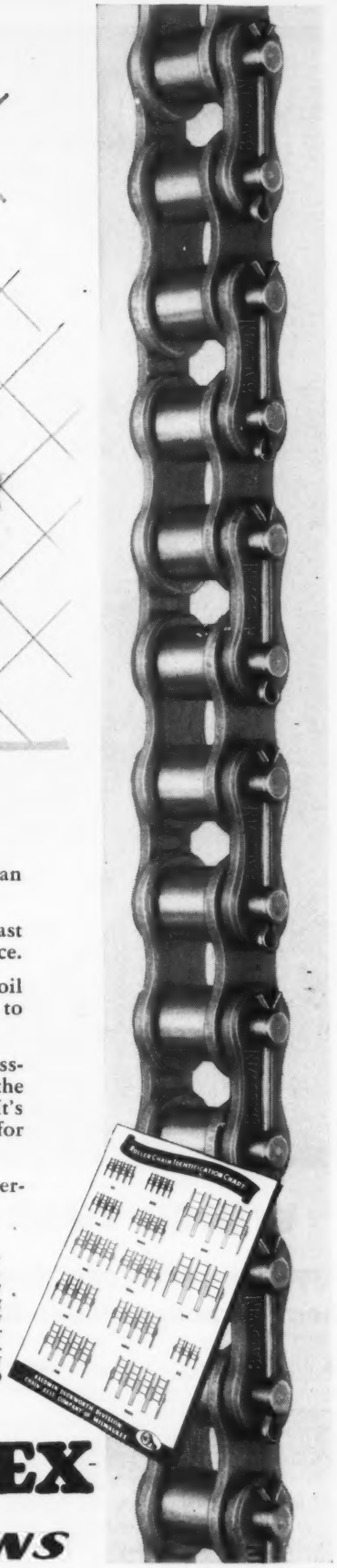

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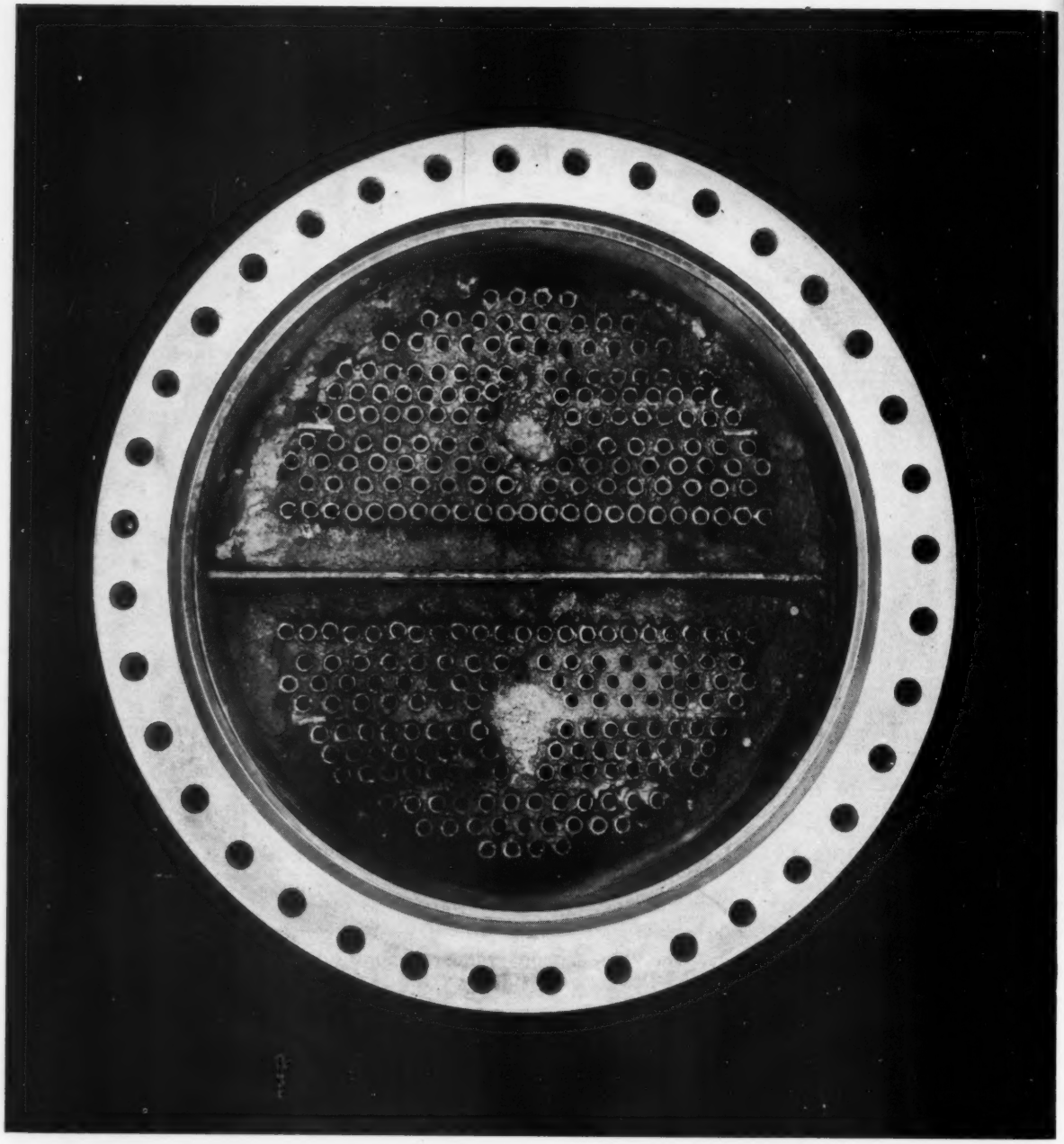

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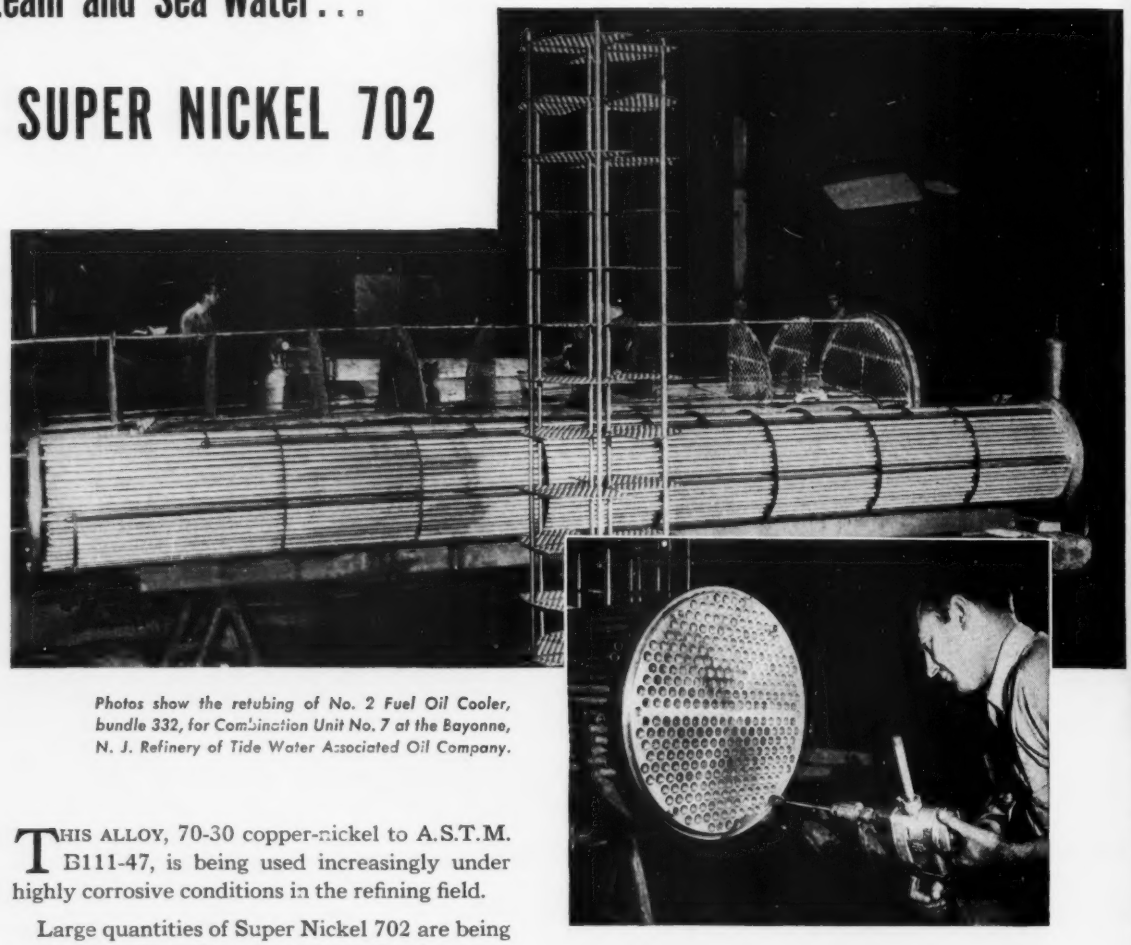

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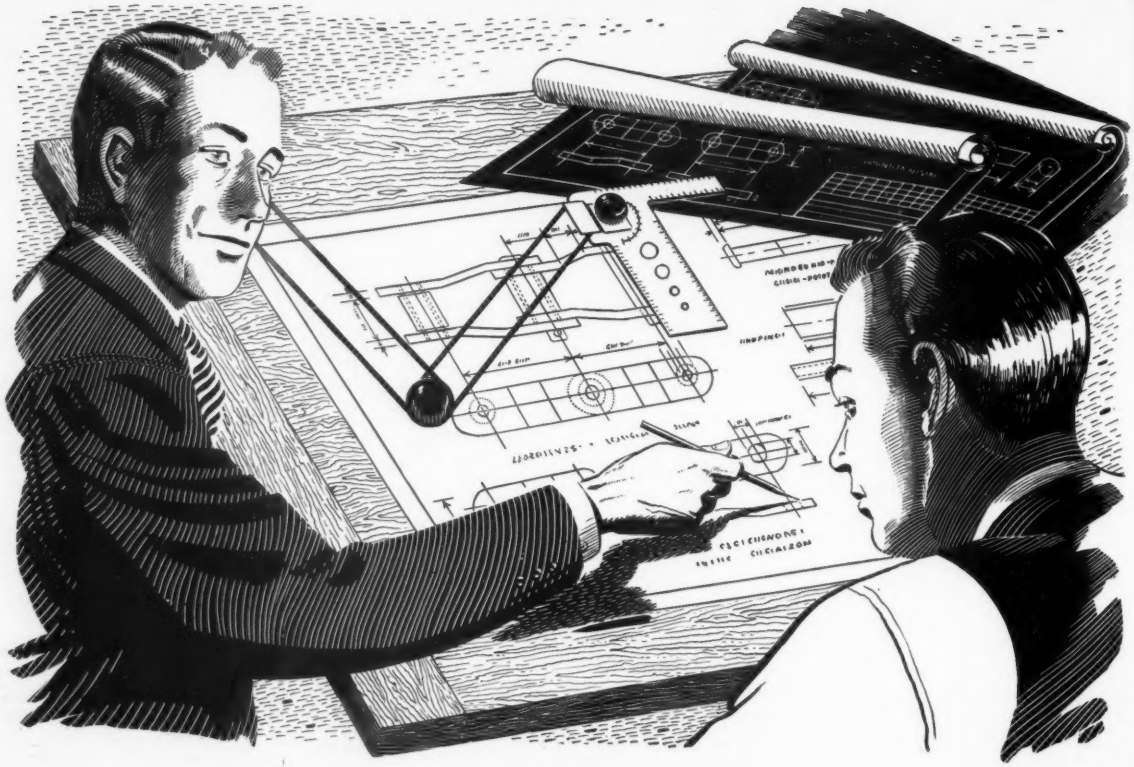

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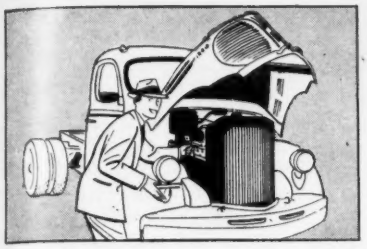

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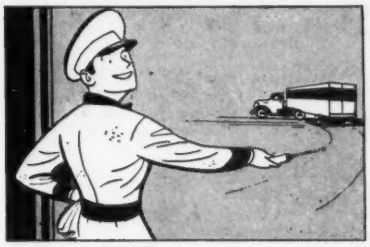

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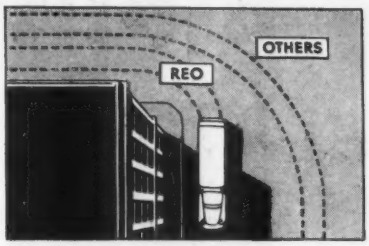

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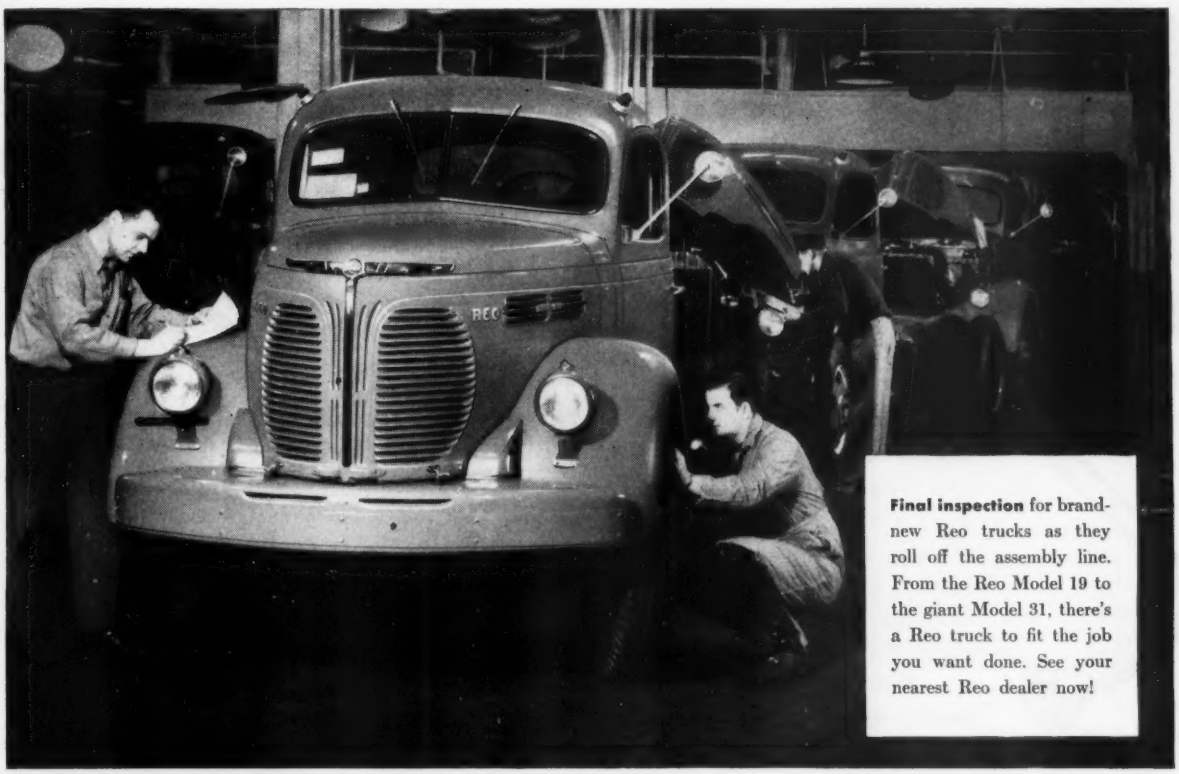

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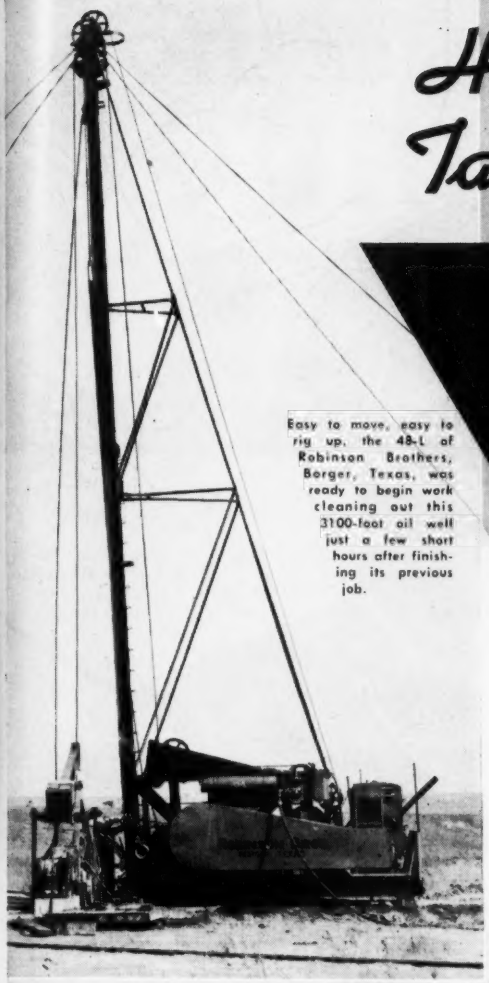

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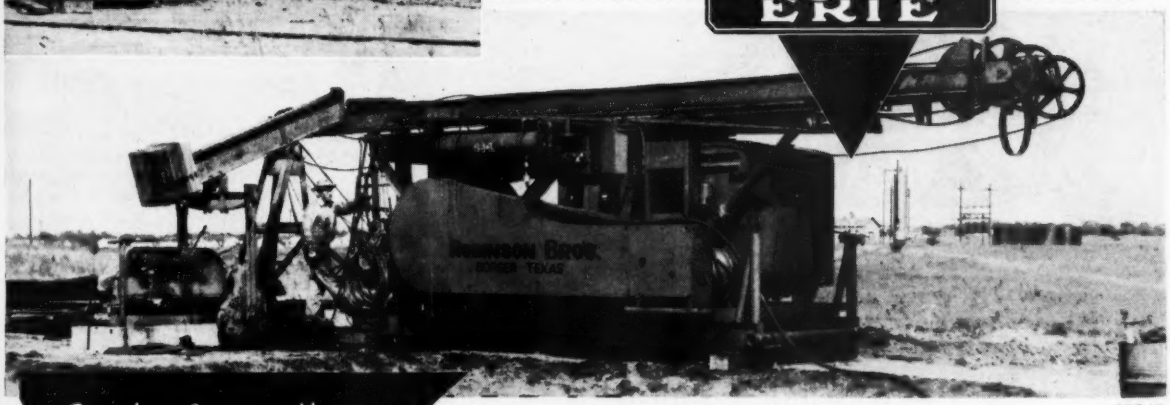

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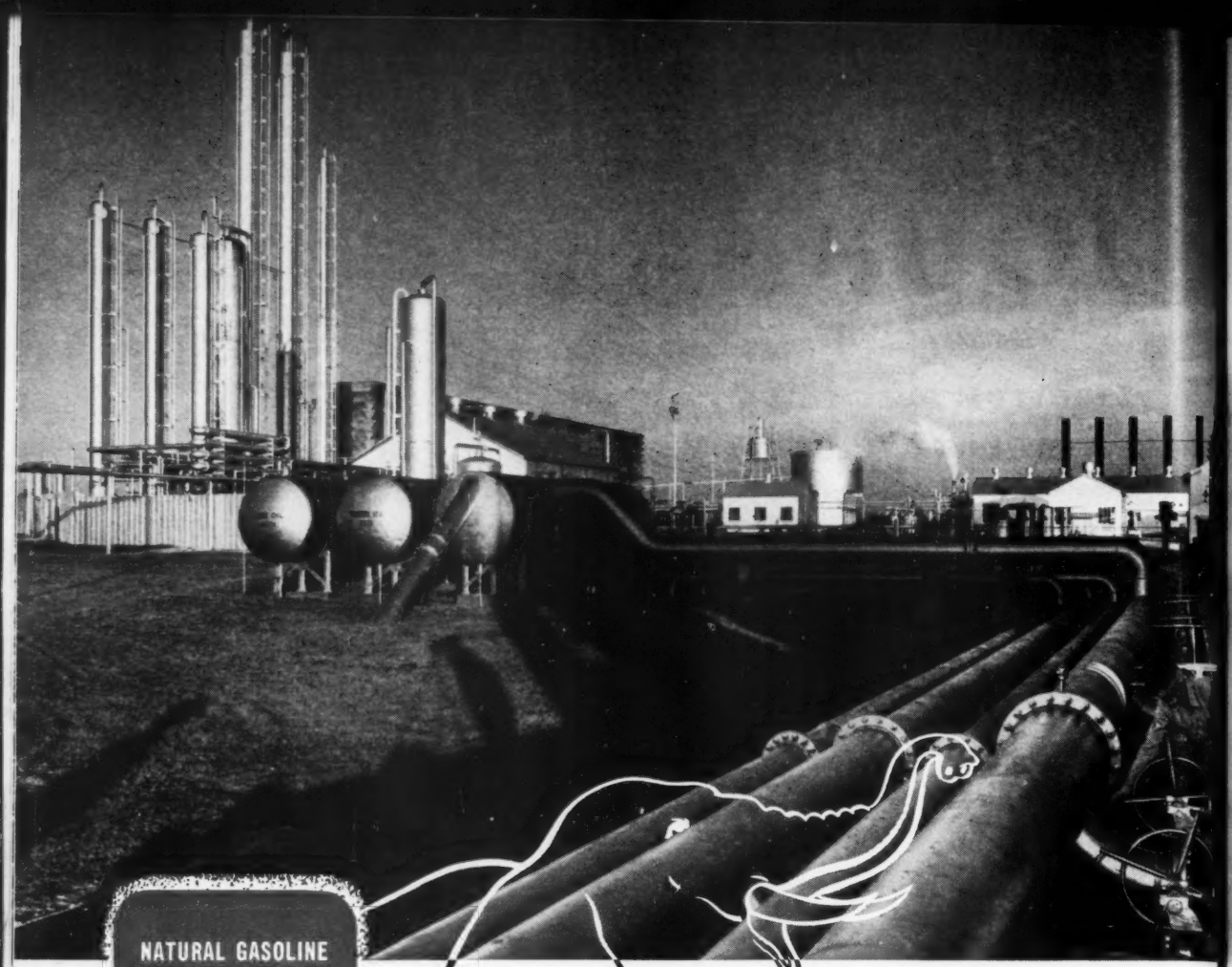

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THE OIL AND GAS JOURNAL

Now Is The Time

THE Republicans in their party platform last week went on record against overlapping taxes. Presumably, similar action will be taken by the Democratic Party when it convenes this month.

With this support many will be inclined to sit back and assume that the next Congress, regardless of party control, will quickly end the federal encroachment of the states and other political units in tax matters, a trend which expanded rapidly during the late emergency and which in the face of record peacetime expenditures has not been reversed since the war's end.

The realists know that convention platform promises are one thing and law making is often something else. The condemnation of overlapping taxation in party platforms recognizes that voters generally are opposed to it. But when the legislators are high-pressured for more revenue to meet the mounting expenditures of government, party planks are easily forgotten.

The oil industry is directly interested in the existing 1½-cent per gallon federal tax on gasoline, 6 cents on lubricating oil, and the 4½-per cent transportation charge. These taxes last year totaled $552,029,389.

In addition there are the federal automotive excise taxes now totaling approximately one billion dollars annually, which, along with the federal levies on petroleum products, are paid for by motorists.

When these federal taxes were first made effective, both the petroleum and automotive industries were assured that they were temporary measures which would end with the emergency. But nothing has been done.

Practically every trade organization representing the oil and automotive businesses, and many other national and local associations whose activities are concerned with consumers, have announced their opposition to the continuance of the war taxes with their overlapping applications. Only the Washington spenders want them, and they have obtained congressional approval either on the grounds that an emergency still exists or that the levies should continue permanently within the scope of federal taxation.

The attempted justification for the automotive and petroleum taxes is that the revenue is used to promote the building of national highway systems. This contention has as much merit as would a special federal tax on the shipping industry because its activities include the building of ships for the Navy. An economy-minded national administration has plenty of tax sources to tap without invading those which properly belong to the states.

The thought we want to stress here is not to rely on party platforms. With primaries under way and a November election in the offing now is the time to obtain commitments from candidates in regard to overlapping taxes and all taxes which will have a bearing on future oil operations.

Federal Cloud Not Halting Work In Gulf of Mexico Drilling

by Dahl M. Duff

HOUSTON. — Failure of the "tidelands" quitclaim bill to become law before Congress recessed leaves a cloud over the currently mushrooming oil operations in the Gulf of Mexico, but there is no chance the work will be halted or even seriously curtailed.

Despite the still-unsettled title and the question on the validity of some $25,000,000 in state leases, management of the companies involved appear willing to depend on ultimately secure state ownership.

Informed opinion in the industry is that the quitclaim bill has an even better outlook than previously, considering the state-ownership platform now in the Republican platform and the likelihood of a Republican victory in November.

The oil industry now has a stake estimated at $65,000,000 in its operations off the Texas and Louisiana coasts. The return thus far has been 400 bbl. daily from one producing well, though the chances of further discoveries are considered excellent. There are 11 companies involved in the 22 separate operations off Louisiana and 7 or more projected off the Texas coast.

That the industry has been willing to undertake these tremendously expensive exploration and drilling programs in the unprotected waters of the Gulf is a reflection, not only of its faith in ultimate "equity" in the matter of title, but also of the present all-out effort to supply the greatest demand for crude oil in the history of the nation.

Lease Terms Spur Work

There are other obvious considerations. Exploration experts feel that major reserves will be found around the numerous salt domes already located by geophysical work in the Gulf. Normal competitive activity and the encouragement of the Kerr-McGee Oil Industries, Inc., Block 32 discovery helped bring some companies into the development. Louisiana's high rentals of one-half the lease bonus and the prospect of expiration of some leases also has spurred offshore work.

The quitclaim bill passed the House 257-29, was reported favorably 6-5 out of Senate committee but was lost in the closing rush before the recess. It would have restored the situation that historically existed prior to last year's Supreme Court decision in the California case and would have secured Texas' boundaries out to 10½ miles and Louisiana's boundary to either 3 or 10½, depending on what was considered the line at the time it entered the union.

Although Congress has technically recessed, it is not felt that the bill would not again be considered even in the unlikely event that Congress reconvenes. The measure has been threatened with a presidential veto throughout, and there is some indication it would be preferable for it to be reintroduced next year in a possible Republican administration. Governor Dewey, the Republican candidate, was one of the governors who signed a message to Congress endorsing the quitclaim legislation.

Politics a Factor

Opinion widely varies as to whether the Democratic party will incorporate a similar state-ownership plank in its platform. This would give some further encouragement to officials of companies operating offshore, but it is considered inconsistent with actions of the Truman administration in espousing federal control. Such a plank might be voted to appease the southern Democratic group who have been alienated over the civil-rights issue.

There is also speculation among company officials in Texas over whether U. S. Atty. Gen. Tom Clark will carry out his announced intention to file suit to establish federal ownership of the offshore areas of Texas, Louisiana, and other Gulf Coast states. One view is that the suits, which would require a year or more to reach the Supreme Court, would mean little in the present situation.

Clark told a Senate-House committee several months ago the new suits are planned but indicated they would be withheld while the quitclaim bill was pending. Federal representatives called on the General Land Office in Austin, Tex., some time ago for factual data to use in preparing the cases. It was refused. Political considerations may lead the Truman administration to deter these suits until after the election. They are certain to stir up further controversy from state officials who are waging the fight for state ownership.

Practically all the drilling work now under way along the Gulf is off the Louisiana coast and this is on leases taken prior to June 23, 1947, the date of the Supreme Court decision holding the federal Government has paramount rights to California's marginal sea. The oil companies involved feel these leases, if not the later ones, will be honored with priority rights even if the Government obtains ultimate control.

Priority for bona fide state leases was provided in the administration bill for federal administration which was shelved in congressional committees. Several companies operating offshore in the Gulf sought to protect their leases further by filing applications with the Interior Department covering the state-leased areas. These applications were rejected by the Interior Department on grounds there is no applicable law.

Louisiana is far ahead of Texas in granting offshore leases, and this is reflected in the progress of development in the two states. Texas has held one sale, and this was last November. A Louisiana Mineral Board official said the state expected to continue granting offshore leases until an injunction was obtained against it.

To date, Louisiana has leased 2,117,000 acres off its coast and taken in $18,191,522. Only last week, the Louisiana Mineral Board asked for bids on 146,290 inland acres and 5,264,000 acres offshore. The offshore acreage up for lease is in all areas except East Cameron and South Pass. Bids were called for July 6.

Further development in Texas is hampered by legal rulings that geophysical work can be conducted only on leased acreage, although some companies are reported to be taking advantage of what amounts to practically an invitation of the General Land Office to violate this and be sued later for the value of the "privilege so exercised."

State Line Disputed

Another confusing ramification of the "tidelands" situation is the fact there is a large fan-shaped area between Texas and Louisiana which both states appear to be claiming. Louisiana on its maps went due south with the boundary, while Texas followed the course of the Sabine River, even extending this east to the river's old underwater channel.

The investment of the oil industry in Gulf Coast operations is mounting daily as more structures are built and as active drilling spreads westward along the Texas coast. Only oil so far found was in Kerr-McGee's shallow discovery in Block 32, Louisiana Ship Shoal area, now on a special 400-bbl. daily allowable. The heavy investment which has been made before any substantial production is realized is typical of many foreign operations which have been

undertaken by American oil companies.

The $65,000,000 estimated as already having been spent is considered to be, if anything, on the low side. Texas and Louisiana have taken in a total of about $25,000,000 from their leases, and geophysical exploration costs are roughly estimated at about $15,000,000. A single offshore crew costs from $25,000 to $30,000 monthly.

Off Louisiana there are 8 tests drilling, 10 platforms finished or under construction, and 4 definite locations. Although Humble Oil & Refining Co. spent $1,200,000 in constructing its Grand Isle platform, largest and most expensive yet built, average cost of these offshore tests is estimated at about $400,000 each. Other costs such as research and development work and boat purchases add to the total.

Operations off the Texas coast have not progressed beyond the stage of driving of test piling and planning platform construction. Work is expected to be under way in this section of the Gulf shortly, however.

Notices from the U. S. Army Engineers Office in Galveston, which approves all offshore construction from the standpoint of navigation, indicate at least seven wells planned, and possibly more. *(Details of drilling operations and plans off the coasts of Louisiana and Texas were given in The Oil and Gas Journal, June 24, page 152.)*

Government Seeks to Claim Tidelands Without Awaiting New Legislation

by Bertram F. Linz

WASHINGTON. — Interior Department officials were disclosed this week to be canvassing ways in which the Government may fortify its position with respect to the tidelands oil resources of California, Texas, and Louisiana in the absence of legislation by Congress either returning the California lands to the state or providing for federal administration.

Three paths by which the Government might move toward this objective have been outlined for Secretary J. A. Krug by his solicitor, Mastin C. White, but none of them offers any promise of additional production so long as the final issue of ownership is in doubt.

The most serious obstacle to the further development of the submerged lands, White conceded, would be the unwillingness of operators to spend any money on drilling on land which might turn out not to belong to the Government.

White's opinion referred to a previous one, supported by Attorney General Tom C. Clark, that the Mineral Act does not cover submerged lands, but, he added, "even in the absence of legislation specifically authorizing the issuance of oil and gas leases or the making of other agreements for the production of oil and gas from the submerged coastal lands, there are three possible bases of authority for the taking of action by the executive branch of the Government."

Those bases, the solicitor said, are (1) the implied authority of the executive branch to take protective measures in cases where oil-bearing federal lands are being drained by adjoining owners, not subject to the leasing law; (2) the statutory authority of the Attorney General to conduct litigation on behalf of the United States, and (3) the power of the President to set submerged areas apart as naval petroleum reserves, on the precedent of the Alaskan reserve, which includes some water areas.

With respect to the use of the "protective measures" device, White said, there are two obstacles to the use of this implied authority in connection with the submerged lands.

"In the first place," he pointed out, "its use is limited to situations in which oil is being drained from government lands by adjoining owners. It may well be desirable, in the light of the great need for further oil and gas development, that arrangements for such development in the submerged coastal lands be made even in the absence of drainage.

Boundaries Are Uncertain

"In the second place, it is probable that this implied authority, as a practical matter, cannot be used effectively with respect to the Government's submerged coastal lands so long as the precise boundaries of such lands are uncertain. Until the dividing lines between the Government's submerged coastal lands and the adjacent lands owned by the states or other persons shall have been definitely ascertained, it will always be difficult, and frequently impossible, to establish the fact that oil or gas is being drained by an adjacent landowner from land that is subject to the paramount rights of the United States.

"Moreover, oil operators will be averse to making the financial outlay necessary for the drilling of offset wells under protective leases issued by the executive branch of the Government, so long as there is a possibility that the areas selected for drilling will turn out, in the end, to belong to persons other than the Government."

The uncertainty as to the boundaries of the California lands which would become federal under the Supreme Court decision extends also to the lands off Texas and Louisiana, particularly the former "by virtue of certain provisions in the annexation agreement under which Texas entered the Union," where the rights of the Government have not yet been clearly established but will be sought in actions now being prepared by the Attorney General, White said.

The present stipulation concerning operations in the California tidelands will expire September 30 as a result of the failure of Congress to enact any legislation on the subject, and during August the parties to the agreement are to meet to reconsider the terms of the stipulation and determine whether it should be continued for a further period, White pointed out.

"If California and the Government should be unable to agree on an extension of the stipulation," he said, "then it is assumed that the Attorney General would seek an injunction and the appointment of a receiver to manage the property that is involved in the litigation. A similar course could be followed as an incident to the proceedings which the Attorney General is expected to commence in the Supreme Court against Texas and Louisiana.

Injunction Suggested

"That is, the Attorney General could attempt to negotiate a stipulation for continued operations and the holding in escrow of any proceeds accruing to the states, pending a final determination of the issue of superior right as between the United States and the respective states, and, if the United States is successful, pending an actual fixing of the low-tide lines and seaward limits of the inland waters of those states. If it should be impossible to negotiate with either state a stipulation satisfactory to the United States, an application for an injunction and the appointment of a receiver to manage the property involved in the case would be appropriate."

The final alternative of setting aside part or all of the tideland oil areas as a naval reserve would make them subject to the administration of the Secretary of the Navy for the production of oil and gas under existing legislation, White said, but here, again, "practical difficulties" doubtless would be encountered.

"Congress is not likely to appropriate funds for drilling operations by the Navy Department in the submerged coastal lands so long as there is strong sentiment in the Congress for transfer of such lands to the adjacent coastal states," he commented.

Navy Purchase of Persian Gulf Oil Seen as Realistic Policy

by Warren W. Burns

NEW YORK. — The announcement that the Navy is buying Persian Gulf oil brought the comment among oil-company executives here that at least the Navy Department is taking a realistic view of foreign oil regardless of the policies of other branches of the Government.

While the Commerce Department blows hot and cold on exports of steel for Middle East pipe lines and the State Department shies away from a firm stand on American oil operations in various parts of the world, it is pointed out, the Navy's contract is a practical way of saving money, obtaining petroleum products in the areas in which they are needed, and relieving the drain on domestic supplies.

Illustrating the savings which will be effected by the Navy contract to purchase 98,500,000 bbl. of oil during the next 5 years is the fact that the price for Navy special fuel oil is $1.48 per barrel as against an approximate cost of $2.63 at United States Gulf ports.

Other comparative savings which the Navy will make may be seen by the fact that Navy diesel oil will be purchased in the Persian Gulf for $2.11 per barrel while the current United States Gulf Coast price is from $3.50 to $3.75 per barrel. The Navy contract price of $3.3915 per barrel for 72-octane gasoline compares with $3.57 pe barrel at the Gulf Coast, and this is figured on the basis of the low of 8.5 cents per gallon.

Earlier this year the Navy publicly stated that by buying petroleum products in the Persian Gulf the Government saved more than $26,500,000 during the 1942-1947 period *(The Oil and Gas Journal, May 6, page 56)*.

Tanker Costs Are Lower

Another factor is that the Navy is saving additional sums on transportation by purchasing oil in the Persian Gulf as the oil will be used in nearby areas.

It was also pointed out that the Navy's 5-year contract is refutation of charges made this past winter that the parent companies of Caltex (Standard Oil Co. of California and The Texas Co.) were selling fuel oil to the Government at prices higher than it could be purchased elsewhere.

Commenting upon the purchase of foreign oil by the Government, Howard Page, assistant to the president of the Standard Oil Co. (N. J.), said that "an understanding of the petroleum logistics of the recent war is essential for an analysis of present and future national security problems, as transportation may again be the bottleneck." The location of supply sources in relation to destination is of major importance, Page added. During the war Page was head of the program division in the Petroleum Administration of War and played a major role in handling international oil-supply problems.

Offshore Supply Difficult

"During the recent war," Page stated, "most of the military requirements were for offshore use. The problem of supplying essential civilian requirements, ships bunkers at United States ports and onshore military demands, was simple. There is no reason to believe that it would not also be simple in the future even with considerably higher offshore military demands. The difficult problem comes in supplying the offshore military requirements in addition to essential foreign civilian demand and ships bunkers.

"The supply sources for these offshore demands are of great importance if the transportation problem is to be solved. This is a matter of analysis by military and petroleum experts. However, it is of interest to note that the Caribbean is a shorter-haul source to all Atlantic and Pacific destinations than the United States Gulf Coast; the Mediterranean is closer to all European ports than any Western Hemisphere source; and that Sumatra, Borneo and New Guinea and even the Persian Gulf are closer supply sources for the western Pacific than the Caribbean or Gulf Coast.

"This indicates that even if domestic petroleum supplies were considerably greater than presently contemplated the logistics of wartime supply would draw attention to the desirability and even essentiality of having large supply sources more strategically situated for offshore destinations than those of most areas of the United States."

Expanding upon this theme, Page pointed out that "the foreign oil properties of both American companies and those of our Allies were absolutely indispensable to winning the war. One of the principal reasons for this was the tanker situation. The operations of these properties provided shorter-haul sources of supply than if the materials had been obtained from the United States. This resulted in meeting the military requirements which otherwise would have been impossible even if more oil had been available from the United States.

Caltex Signs 5-Year Contract for Navy Oil

WASHINGTON. — The Navy Department has completed negotiations with the Caltex Oil Products Co. for a 5-year contract under which it will take 98,500,000 bbl. of products from the Persian Gulf. Total value of the contract is estimated at $182,850,000.

Under the agreement the company will furnish 60,000,000 bbl. of Navy special fuel oil at $1.48 per bbl., 28,500,000 bbl. of Navy diesel at $2.11, and 10,000,000 bbl. of motor gasoline at $3.3915. All prices are well under the Gulf prices for corresponding products.

The Navy proposes to use the products in areas closer to the Persian Gulf than to any other oil producing area, and it was pointed out that the department not only will save money on its oil purchases, but also cut down transportation and ease the drain on Western Hemisphere resources.

Producers Ask End of West Texas Differential

MIDLAND, Tex.—A group of independent producers in West Texas following a meeting here have asked 10 major buyers to drop the existing differentials between the prices paid for West Texas crude oils and other Mid-Continent crude oils of the same gravity. The differential in the posted prices for Oklahoma-Kansas and North Texas crude oils and the West Texas crudes which are given the general classification of "sour" crudes is 13 cents per barrel. A variation in posted prices has prevailed for several years based on the difference in the refining value of sour and sweet crudes of the same gravity.

Several of the major companies have replied to the requests of the independent producers indicating that studies will be made to determine what differentials if any should now prevail. The independent producers point out that owing to the shortage in petroleum supplies there are being offered premiums over present posted prices for the West Texas crudes. Some of the West Texas crudes are sweet crudes and in these cases there are no price differentials in the postings.

this week

GOVERNMENT—Interior Department seeks ways of nailing down federal claims to tidelands and offshore oil reserves despite failure of Congress to act on the subject. . . . But federal threat does not stop exploration and drilling in the Gulf where tempo of activity is increasing. . . . ¶Recess investigations of congressional committees hear oil-industry allocation program, practices of major companies, and possibility of fuel-oil shortage described as threat to independent marketers. . . . ¶National Petroleum Council called to meet July 29. . . .

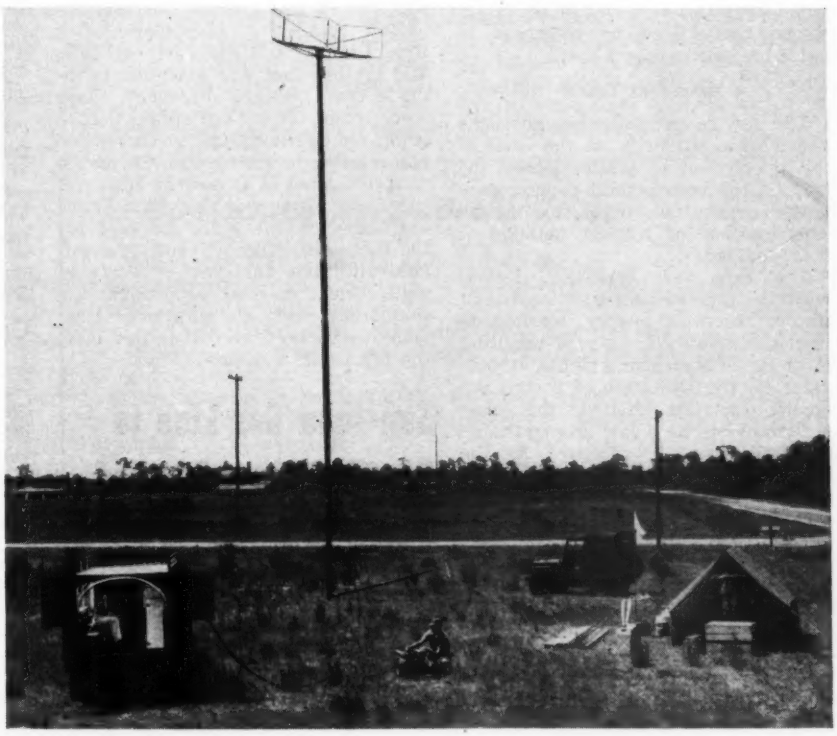
INTERNATIONAL—Trans-Arabian Pipe Line Co. shifts route and curtails activity as pipe exports are denied. . . . Lack of pipe will delay several other Middle East pipeline projects. . . . ¶Gulf Oil Corp. official predicts imports of Middle East crude will increase rapidly in few years. . . . ¶Geophysical survey in Puerto Rico shows possibility of oil discovery there. . . . ¶Soviets claim their crude output is increasing rapidly. . . .

MILITARY—Navy makes long-term contract for Persian Gulf petroleum products. . . . Viewed by New York oil executives as realistic from standpoint of economy and logistics. . . . ¶Army starts survey of sites for synthetic-fuel plants. . . . Move follows failure of Congress to adopt legislation for synthetics program. . . . ¶Military again asks help of industry in filling requirements for special types of petroleum products. . . . ¶New draft law has steel provision which dims oil industry's hopes for pipe-allocation program. . . .

PIPE LINES—Plans are announced for a $150,000,000 pipe line from San Juan Basin area to Salt Lake City, San Francisco, and intermediate points. . . . New project is headed by Byrd-Frost, Inc., Dallas. . . . ¶Texas Gas Transmission Corp. seeks FPC approval for 840-mile natural-gas line from Carthage field, Texas, to point near Middleton, Ohio. . . . ¶Construction under way on two Socony-Vacuum Oil Co., Inc., lines. . . . Southern end of Malvern, Pa.-Binghamton, N. Y., 156-mile, 8-in. products line has 3 miles of pipe laid. . . . Pipe laying begins on 124-mile, 6-in. Portland-Bangor, Me., products line. . . .

REFINING—U. S. Bureau of Mines and Alabama Power Co. plan underground coal gasification experiment at Gorgas, Ala. . . . Preliminary work is already under way. . . . ¶Shell Oil Co., Inc., completes new $1,000,000 control laboratory at Deer Park refinery near Houston. . . . ¶Three oil companies establish petroleum engineering fellowships at University of Oklahoma. . . .

TRENDS—Record crude production continues. . . . Week ended June 26 makes another all-time high for the sixth consecutive week. . . . Production averaged 5,494,450 bbl. daily. . . . An increase of 3,765 bbl. over previous week's record high. . . . Mississippi set new all-time high for week ended June 26 with 125,950 bbl. daily. . . . Montana and Oklahoma set new highs for the year. . . . ¶Daily average this year for crude and condensate production through week ended June 26 was 5,456,380 bbl. daily. . . . Eleven per cent over production for similar period last year. . . . ¶Total completions this year through week ended June 26 are up 19.3 per cent over the same period last year. . . . Cumulative wildcat completions for this year are up 21 per cent over year ago. . . . ¶Footage drilled this year to week ended June 26 totals 61,100,000 ft. . . . A gain of 19 per cent over the similar period last year. . . . ¶Runs to stills for week ended June 19 drop slightly from previous week. . . . Decrease is reflected in gain of crude stocks, up 763,000 bbl. over preceding week. . . . ¶Gasoline stocks down slightly for week ended June 19. . . . Other three major stocks show gain. . . .



Portable radar stations are becoming familiar sights in areas of oil exploration as the oil industry takes to the air to locate underground reserves. This shows a Shoran ground station on location in Florida controlling the flight of an airplane while making an airborne magnetometer survey

Mississippi Oil Board Asks for Proposals for New Regulations

MISSISSIPPI'S new Oil and Gas Board has called on operators in the state to submit any proposals for revisions in state-wide regulatory rules and also for suggested rules of procedure before the board.

The board, created as a result of Mississippi's new oil and gas conservation law which was enacted by the last legislature, held its first protested hearing last week in Jackson. It decided to allow Gulf Refining Co. 18 months in which to make up overproduction from Gwinville gas field.

Under the new conservation statute, existing state-wide rules continue in effect for 6 months after passage of the law. These existing rules prescribe 40 acre oil and 320 acre gas spacing and lay down various regulations dealing with casing, deviation, fire hazards, identification of wells, normal plugbacks, reports, and certificates of compliance.

The new board, made up of 5 members not connected with the oil industry and headed by James McClure, Sardis, Miss., attorney, as chairman, is expected to consider changes in state-wide rules and suggestions for board procedure within the next 30 days. The form of applications and orders and rules for conducting hearings will be a part of the procedural setup. This may determine whether small operators will find it necessary to be represented by attorneys in cases before the board.

Aimed at Waste

The new conservation law gives the board wide authority on the basis of the prevention of waste. Under the statute, the board could prorate as a waste-prevention measure, though consideration of market demand is not provided.

The new law concisely defines waste as practices causing inefficient use of reservoir energy, tending to reduce ultimate recovery, or resulting in abuse of correlative rights. It provides for the allocation of production among tracts on whatever the board determines to be a fair and equitable basis. Acreage is specified as the basis for allocation in smaller than standard spacing.

One apparently unique provision in the Mississippi statute provides that the board shall investigate costs of drilling discovery wells and that discoveries will not be liable to restriction until after actual expenses incurred in drilling are recovered.

It allows penalties for excessive gas-oil ratios and other wasteful practices. Pooling for cycling or pressure-maintenance operations is specifically authorized and declared not to be in violation of antitrust statutes of the state. To avoid unnecessary drilling, the board may authorize valid agreements for pooled drilling units, of 40 acres or less.

In deciding its initial protested case, giving Gulf 18 months to make up Gwinville gas overproduction, the board approved a plan that satisfied the other producers, eight of whom had protested. Gulf and United Gas Pipe Line Co., which buys gas from Gulf in Gwinville, Baxterville, and Soso fields, asked a year in which to make up underproduction and that the cut be started later in the year. The decision provides that the production rate reduction start immediately.

Overproduction amounted to approximately 2,750,000 cu. ft. from 21 wells in Gwinville. Making this underproduction during the next 6 months as normally required would have forced shutting in the wells. Some of the other operators asked that this be done.

In its request for an extension of time in which to make the underproduction, the two companies pointed out that shortage of materials and delay in obtaining federal certificates had retarded planned expansion. Demand in Mississippi and in the Jackson district had greatly increased.

Gulf contracted with United Gas Pipe Line to sell gas early in 1946, and the contract was amended to include Soso after its discovery. Plans were made for a Soso connection to bring an additional 50 to 60 million cubic feet into the system. Gwinville was connected in December 1948, but the Soso connection was not made until May of this year, and pipe for the Baxterville line will not be available until late this year or early in 1949. Under normal conditions, the companies said, no additional time would have been needed to pay back the Gwinville overproduction.

San Juan Gas Line to San Francisco Planned

PLANS for a $150,000,000 pipe-line project which will connect Salt Lake City and San Francisco and intermediate points with the gas reserves of the San Juan Basin area of the four-state corner section of Utah, Colorado, Arizona, and New Mexico were announced last week following a meeting of interested parties at Durango, Colo.

This program calls for the drilling of a number of wildcat and development tests as quickly as possible so that with the required proven reserves established it will be possible to go ahead with plans for the laying of the line.

The proposed route of the line to Salt Lake City would include Monticello and Provo, and between Salt Lake City and San Francisco, Carson City, Reno, and Sacramento would be included. At present Salt Lake City obtains part of its natural-gas requirements from southwest Wyoming by a system owned by the Mountain Fuel Supply Co. San Francisco and Sacramento secure their gas supplies from California fields. There have been requests for additional supplies by industrial interests of the three cities and by intermediate points which do not, at present, have natural gas service.

The new project is headed by Harry Byrd of Byrd-Frost, Inc., Dallas, which in association with Paul B. English of Farmington, N. M., has been engaged for several years in an extensive leasing and exploratory program in the four-state area. It is said that 44 different structures, all considered favorable for natural gas, have been established in what is generally termed the San Juan Basin area.

At present the Southern Union Gas Co. operates a gas system out of the area connecting to Albuquerque, Santa Fe, and other New Mexico points. Plans are under way by which El Paso Natural Gas Co. and Western Natural Gas Co., which is associated with the Byrd-Frost interests in the lease ownership of 15 of the structures, will lay a big-inch line to connect with the Texas-California system of El Paso Natural at Blythe. An article dealing with the San Juan Basin area in New Mexico and southern Colorado by Frank C. Barnes, geologist with the New Mexico State Oil Conservation Commission, was published in the May 27, 1947, issue of The Oil and Gas Journal, starting on page 73.

Merger of Three Michigan Companies Is Under Way

Financial negotiations are under way by Roosevelt Oil & Refining Corp., Mt. Pleasant, Mich., to purchase the outstanding stock of Roosevelt Oil Co., Simrall Corp., and C. L. Maguire, Inc., all of Mt. Pleasant.

The three companies being purchased have operated together in the petroleum producing, gathering, refining, and marketing business in Michigan. For the calendar year 1947 combined net sales of the three companies amounted to $18,580,806 and net profit after federal taxes on income amounted to $409,907.

Arthur W. Winter is president of Roosevelt Oil & Refining Corp.

Miller Takes Helm of Revised Petroleum Information Program

THE appointment of Rear Adm. Harold B. Miller, U.S.N. (retired) as director of the department of information of the American Petroleum Institute, announced this week in New York, follows a change in the public-relations program of the oil industry which is currently being put into effect.

National magazines this month are carrying the first of a new series of advertisements sponsored by the Oil Industry Information Committee and based on the theme of how 34,000 oil companies serve the nation.

Last year's theme of "understand rivalry and you understand America" has not been abandoned, but present emphasis is on explaining to the public the causes of the recent stringencies in petroleum supplies and what the oil industry is doing to increase production and distribution. Advertisements show the tremendous growth in the use of internal-combustion engines on highways, farms, railroads, and in industry, and explain how time, money, and steel are required to find more oil, drill more wells, build more refineries, and lay more pipe lines.

Recent surveys have shown that in most areas the general public does not blame the oil industry for the spot shortages of heating oils which plagued many regions last winter, and that most people feel that the industry is doing its utmost to remedy the situation. The A.P.I.'s public-relations program is credited with creating this public attitude.

Local Work Stressed

In addition to the national display advertising, the O.I.I.C. is distributing smaller pieces of advertising and public-relations copy for use by individual oil companies and groups in local newspapers, radio programs, house organs, and other media, and is conducting a campaign within the oil industry to make company officials more conscious of the need to keep the public informed of their activities.

Local and district public-relations groups within the industry are being strengthened in order to tell the industry's story at the community level. An important part of this phase is the series of meetings with farm groups for the purpose of helping farmers use petroleum products more efficiently.

The most recent project of the O.I.I.C. is publication of a "Public-Relations Manual for the Oil Industry." This is a handbook for oil-company officials to explain the elementary principles of building good relations with employes, stockholders, royalty owners, the community, the press, and the public generally. It contains many examples of small things done by various concerns which brought large results in improving good will and mutual understanding.

HAROLD B. MILLER

Admiral Miller is expected to have general direction of the entire campaign, for in addition to his position as head of the A.P.I. department of information, he will serve as executive officer of the O.I.I.C. under Chairman Ralph C. Champlin of Ethyl Corp.

Miller retired from the Navy in 1946 after serving as the department's director of public information. Prior to that he had been public-relations officer for Fleet Adm. Chester Nimitz in the Pacific Ocean area. Before being assigned to public-relations work Miller had a distinguished career as a line officer in the Navy.

Robert E. Allen, who joined the A.P.I. staff at the close of the war after being an assistant deputy administrator of the Petroleum Administration for War, continues with the Institute as assistant director of the department of information.

Catlow Is Elected Republic Supply Head

H. B. Catlow, formerly vice president and manager of sales for Republic Supply Co., has been elected president of the company to succeed A. B. Judd, who has resigned to organize his own company with headquarters in Houston. Catlow came to Republic Supply from Republic Steel Corp., former owner of Republic Supply, and has been located in Houston since 1937. He has been associated with Republic Steel since 1923.

Judd, who has been with Republic Supply since 1922, will continue to serve as a member of the board of directors for that company. Other officials of Republic Supply include J. H. Brooks, Tulsa, vice president, and John Lollar, Jr., Houston, secretary and treasurer.

Announcement of the changes was made by Dean McGee, chairman of the board of directors, Republic Supply, at a meeting of the company officials and district representatives held at the company's general offices in Houston last week.

To Be Seen in Next Week's Issue

Motor Oils—1948 . . . Two of Atlantic Refining Co.'s research engineers present an authoritative analysis of the different factors pertaining to top-quality lubricating oils.

The "Acid Pig" . . . A new development in pipe cleaning.

Seeligson, the South Texas "Giant" . . . Huge new gas conservation project is started.

Developments in Paints for the Petroleum Industry . . . From studies made by the Esso engineering department of Standard Oil Development Co.

New Pressure-Maintenance Project . . . Plomo Co.'s installation at Agua Dulce representative of the many recent smaller Texas Gulf Coast projects of this kind.

The Flying Squadron . . . Atlantic Refining's solution to peak loads in refinery construction-maintenance.

Closed Gas-Lift System . . . Phillips Petroleum Co.'s new installation in the League City, Texas, field.

Fundamentals of Pipe-Line Flow . . . Benjamin Miller, prominent consulting engineer in the pipe-line field, presents the first article in a new treatment of the subject. His previous work in the Journal's Pipe Line Number and other issues last fall created much interest.

International

WORLD-WIDE OIL DEVELOPMENTS

Russian Crude Output Increasing Rapidly, Soviet Writer Claims

WASHINGTON. — The Russian oil industry now plans to attain its 1950 production target of 35,400,000 tons (approximately 708,000 bbl. per day) of oil in 1949, largely through the development of new equipment and techniques, it was disclosed this week in the "U.S.S.R. Information Bulletin" issued by the Soviet Embassy in Washington.

Crude production in the first quarter of this year was 24 per cent ahead of the corresponding period in 1947, and last year's output was 19 per cent better than that of 1946, it was declared by E. Galperson, member of the Collegium of the Ministry of the Oil Industry of the Eastern Areas.

Galperson, writing for United States consumption, revealed that the turbine method of deep drilling is being widely introduced in Soviet oil fields, and engineers are working on the "further improvement of well drilling."

Mobility and mechanization appear to be the main objectives of Russian research, with drilling machines for shallow boring and geophysical apparatus set up on motor vehicles, and geophysical parties provided with multichannel seismic stations to speed geological and geophysical work. Traveling drilling machines are used in all deposits where the oil strata are near the surface, special cranes have been developed for lifting weights in the course of drilling, and new developments have been made in drilling bits.

As in the United States, Russian oil workers are in the high-pay category of labor, Galperson reporting that in terms of wage level, the oil industry is in advance of all other branches of industry. However, he intimated, it is the social setting rather than the well-being of the individual worker that makes the Russian oil effort so successful.

"In the U.S.S.R. we have no rapacious exploitation of oil deposits," he explained. "Being the sole owner of social wealth, the Soviet state takes care to utilize fully and comprehensively the known oil deposits. By concentrating in its hands the huge material and financial resources of the country it creates all the necessary conditions for the rapid and systematic development of every branch of economy, including the oil industry. Lastly, the absence of exploitation of workers in the U.S.S.R. creates a deep interest among the whole people in the progress of socialist economy, and this is an inexhaustible source of the initiative and activity of the masses.

"It is on this basis that the nationwide movement for fulfilling the postwar Five-Year Plan in 4 years has arisen in the Soviet Union."

Fancher Is Appointed Colombian Consultant

G. H. Fancher, petroleum engineering professor at the University of Texas, has been appointed special consultant to the Republic of Colombia to make a survey of the De Mares concession which is held by Tropical Oil Co. and will expire in 1951.

With David Donaghue, Fort Worth consulting geologist and engineer, Fancher will study value of the property and other factors, spending this summer in Colombia. The entire project may take 2 years or longer.

French Refinery Output Reflects Steady Gain

French refineries processed 2,960,000 tons, approximately 147,750 bbl. daily, during the first 5 months of 1948, according to figures released last week in Paris. This compares with a monthly production of 425,000 tons, approximately 105,000 bbl. daily, last year.

Depending somewhat on improved transportation and foreign currency conditions, French refineries may reach an output this year of 8,000,000 tons, approximately 160,000 bbl. daily. This compares with the 1947 annual production of 5,090,000 tons, approximately 102,000 bbl. daily.

However, the French gasoline supply position remains critical, as recently stated by the ministry of industry and commerce, for "the volume of imported motor fuel depends on the government's foreign currency holdings." Fuel-oil and gas-oil imports are given preference over gasoline imports as the former are in great demand by French heavy industries.

Texaco-Pemex Agreement Involves $30,000,000

The Texas Co. has agreed to lend $30,000,000 for the development of the oil industry in Mexico, according to the government oil monopoly, Pemex. Primary use of the Texaco money is reported to be for the expansion of refinery facilities. Although the contract has not been signed, it was reported that the terms have been agreed upon by both parties.

Pemex will pay Texaco 3,000,000 bbl. of heavy-type crude oil a year until the loan and interest is repaid. Technical advice and assistance in prospecting for new wells will be provided by Texaco.

Texaco becomes the second United States oil company recently to invest capital and to aid in the development of production and refining facilities in Mexico. Cities Service Oil Co. recently signed a contract whereby Pemex will receive up to $10,000,000 to be used for exploration of new fields and exploitation of old producing areas.

Pemex Director General Antonio J. Bermudez said The Texas Co. loan is being made without special guarantees, concessions, or pledges against Pemex properties.

A portion of the money to be received from Texaco is expected to be used in reconstructing the Minatitlan refinery in southern Mexico's Gulf coastal region and the building of a new refinery on the West Coast probably at Mazatlan.

Puerto Rican Geophysical Survey Shows Favorable Possibilities

International

A GEOPHYSICAL survey of Puerto Rico, which has been under way for the past 2 years, is now nearing completion, and preliminary results are said to indicate favorable prospects for the discovery of petroleum on that island.

The survey was conducted by United Geophysical Co., of which Herbert Hoover, Jr., is the president, and covered both the northern and sou'hern coastal plains. Final reports are now being compiled and may be released by Puerto Rico government officials within a few weeks.

Backed by the Puerto Rico Industrial Development Co., which has spent about $300,000 thus far in a search for crude oil, the survey was launched early in 1947. Operations have been conducted on a 70-mile line between Toa Alta, a short distance out of San Juan, and Aguada on the western tip of the island. More recently, tests have been made along a 40-mile line between Salinas and Guayanilla on the south shore.

According to W. H. Denning, United's vice president, and its seismologist, W. H. Myers, interesting seismographic structural anomalies have been outlined in both areas surveyed thus far.

"Al.hough we have as yet found no seeps of oil or gas, we are satisfied that oil structures will eventually be indicated," Denning reported. "We have obtained reflected energy which indicates that a sedimentary section with a maximum depth of 6,000 ft. below sea level exists in the south coastal area. In addition to surveying much of Puerto Rico's flat tidelands with the seismograph, a 7-mile offshore area has also been examined by modern water seismograph exploration techniques."

Puerto Rico's oldest exposed rocks are of Upper Cretaceous age, forming the mountainous core of the island, which, all authorities agree, offer small possibility for petroleum deposits. The tertiary rocks which lie uncomformably upon the Upper Cretaceous complex are the only ones which may have oil possibilities. The sedimentary rocks which compose them are in two separate basins, on the north and south coastal plains, but drilling operations were found to be better in the latter area.

Anticline Defined

The seismograph, in tests made here, defined an anticlinal "nose" in the tertiary sedimentary rocks of the south coastal area, according to Denning, which appears to offer promising possibilities for production. Reflection data in general has been of excellent quality and it is believed that the seismograms secured in the marine operations in Puerto Rico are among the best obtained from similar operations anywhere.

Operations in Puerto Rico followed preliminary investigations made by the U. S. Geological Survey under the auspices of the Puerto Rico Industrial Development Co. Tests in Cuba, Bermuda, and the Bahamas where the war-developed "flying magnetometer" is being employed to locate possible subsea oil structures, the successful oil strikes in the Gulf of Mexico off the Louisiana coast, and the rich deposits of Venezuela suggest a theory that Puerto Rico can be the "core" in the Caribbean area.

Because all subsoil rights are government property, final decisions regarding ultimate exploitation of oil deposits rest with Gov. Jesus T. Piñero and the Insular legislature.

Oil of any practical amounts would be a boon to the island's economic life since all petroleum products must now be imported. Puerto Rico's expenditures for petroleum products exceeded $8,000,000, based on 1947's imports of 4,658,000 bbl., an increase of about 800,000 bbl. over 1946, of gasoline, fuel and diesel oil, and kerosine. Gasoline as well as fuel for shipping are the principal products consumed, but there is an increasing demand for industrial fuels. Most of this comes from Aruba and is being used extensively for the several electric power plants that provide the island's industrial and urban areas with electricity.

The recent influx of capital investments from the continent for factories that will put a further strain on the presently limited power system has accentuated a trend in the development of hydroelectric installations.

Drilling shot hole and making a reflection shot in the sugarcane fields near Ponce during the geophysical survey in Puerto Rico

Pipe Export Denial Changes Route of Trans-Arabian; Delays Other Lines

by Paul Reed

TRANS-ARABIAN PIPE LINE CO. will go ahead with the construction of 1,100-mile, 30-31-in. crude-oil pipe line from Abqaiq to Sidon in spite of the refusal of the Office of International Trade to issue permits for the export of 16,000 and 52,000 tons of pipe for the line in the second and third quarters.

Although enough pipe is on hand to continue work until the middle of the fall, the entire construction program will be delayed approximately 9 months as the result of deferment of action on applications for permits. Not only will Trans-Arabian incur large expense from the postponement of pipe shipments but the building of three other projects in the Middle East will be set back. As a final consequence, Middle East crude oil deliveries needed for European rehabilitation and rising world-wide demands will not be available until dates much further in the future than scheduled.

The three other projects to be built after the completion of the Trans-Arabian project will be undertaken in the following order: (1) Middle East Pipe Line Co.'s line from Iran; (2) Gulf-Shell line from Kuwait; (3) Iraq Petroleum Co.'s 30-in. line from Kirkuk. Iraq Petroleum Co.'s 551-mile, 16-in. southern line has been constructed from Kirkuk up to the River Jordan in Trans-Jordan where work was stopped as the result of unsettled conditions. Approximately 20 miles remain to be laid to complete the project in order to make deliveries to Haifa, Palestine. Iraq Petroleum's 530-mile, 16-in. northern line from Kirkuk to Tripoli will probably not be completed until the end of 1949.

Pipe Now Being Laid

Already 238 miles of pipe has been shipped to Trans-Arabian of which approximately 58 miles has been laid. The company is proceeding with a program to lay pipe at the rate of 15 to 20 miles per month.

The section of the line from Abqaiq field to Qatif was put in operation May 1 and is now delivering 200,000 bbl. daily of Arabian American Oil Co.'s production in Saudi Arabia which totals approximately 400,000 bbl. daily. The Abqaiq-Qatif section consists of 18 miles of 20 and 22-in., laid at the Abqaiq end by Arabian American, and 40 miles of 30 and 31-in., laid by Trans-Arabian, which continues the line to Qatif. The line will be built by Trans-Arabian from Qatif via Abu Hadriya toward the Mediterranean terminal at Sidon, Lebanon. The changes made in the originally planned direct Abqaiq-Sidon route will insure flexibility of operations to meet possible future contingencies.

The dispersal of ships chartered for shipping pipe held up by export permit delays will cost Trans-Arabian half a million dollars. Several months will be required to assemble the 12 ships of Liberty type after it becomes certain that pipe may be exported for the project.

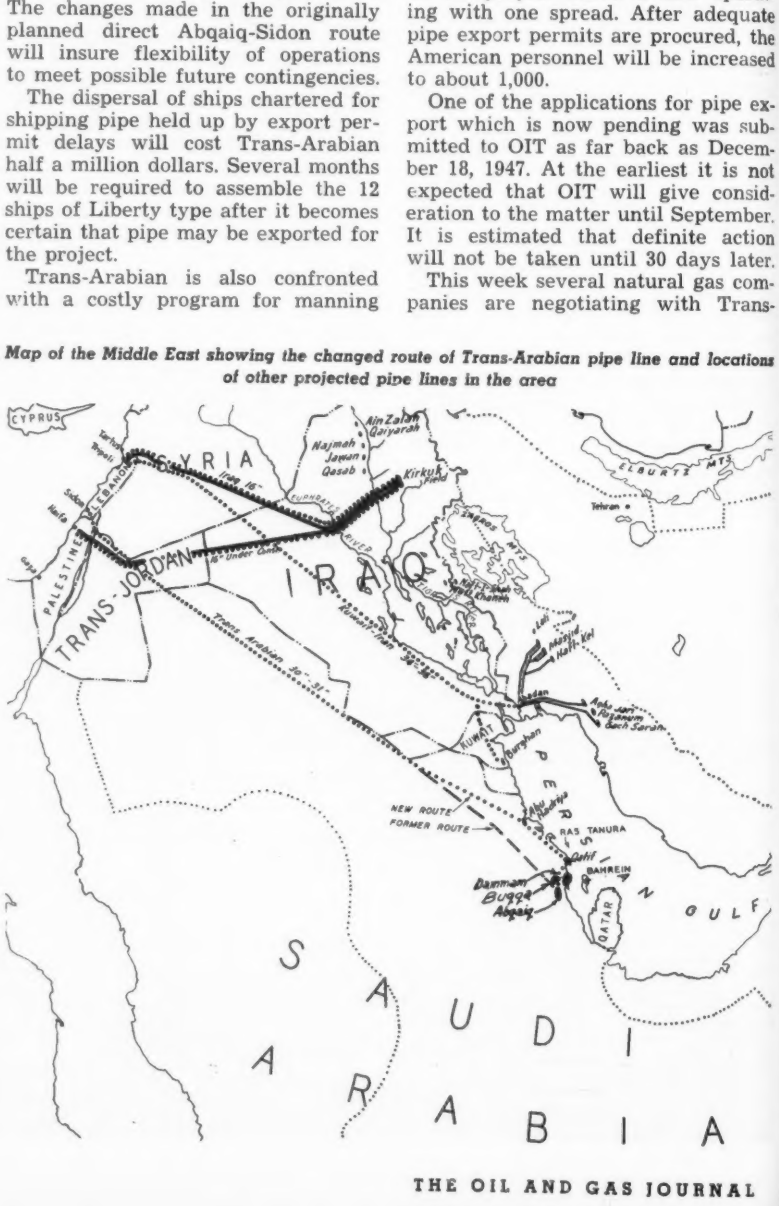
Trans-Arabian is also confronted with a costly program for manning the undertaking with American personnel for full-scale operations. Change of pace in the work has resulted in the return of some Americans to the United States. It cost the company approximately $5,000 to send over and return a Trans-Arabian employe engaged in the United States.

There are now approximately 500 Americans and 2,500 Arabs working on the project which is now operating with one spread. After adequate pipe export permits are procured, the American personnel will be increased to about 1,000.

One of the applications for pipe export which is now pending was submitted to OIT as far back as December 18, 1947. At the earliest it is not expected that OIT will give consideration to the matter until September. It is estimated that definite action will not be taken until 30 days later.

This week several natural gas companies are negotiating with Trans-

Map of the Middle East showing the changed route of Trans-Arabian pipe line and locations of other projected pipe lines in the area



Arabian for the purchase of 60 miles of 30 and 31-in. pipe which has accumulated at Long Beach, Calif., waiting for the issuance of permits. Deals to be made will probably also dispose of pipe, contracted by the company from the Consolidated Steel Corp. mill at Los Angeles, which will be available until Trans-Arabian is permitted to resume shipments to the Middle East. Such pipe for use by natural gas lines is expected to go via the Panama Canal for transshipment in the Gulf Coast area of the United States.

Aside from the 1,100-mile, 330,000-bbl. Trans-Arabian line under construction the system of Arabian American Oil Co. which is now in operation consists of 241 miles including the following:

Field and terminal—	Miles	Diameter in inches	Capacity	Year completed
Abqaiq, Dhahran	40	14	110,000	1947
Abqaiq, Dhahran	40	12-14	100,000	1946
Abqaiq, Ras Tanura via Buqqa	65	30-22-20	300,000	....
Dhahran, Ras Tanura	23	12	123,000	1946
Dhahran, Ras Tanura	39	10	65,000	1939
Dhahran, Bahrein	34	12	110,000	1945

U. S. Imports of Middle East Crude Oil Expected to Soar During Next 5 Years

APPROXIMATELY 1,000,000 bbl. daily of crude oil from the Middle East and Latin America may be imported by the United States by 1955, according to R. M. Bartlett, a vice president of Gulf Oil Corp.

Bartlett estimates that this year crude-oil imports from the Middle East will average 30,000 bbl. daily and that in 1949 these crude oil imports will be around 60,000 bbl. daily, increasing to 150,000 bbl. daily by 1951-1952. By 1955, the Gulf executive said, approximately 500,000 bbl. daily might be imported from the Middle East, and by 1951-1952 our Latin American imports might be 600,000.

Discussing the number of tankers which will be needed in the Persian Gulf-East Coast trade, Bartlett said: "A T-2 with a capacity of 100,000 bbl. now requires 57 days for the round-trip between New York and the Persian Gulf. This means it could deliver in New York at the average rate of approximately 1,680 bbl. per day. One hundred tankers would therefore bring in an average of 168,000 bbl. per day of Middle-East crude. This is only 1.75 per cent of the world demand this year. It is therefore very evident that we need to greatly increase our tanker fleet in order to haul the crude which is required to satisfy the tremendous demand for petroleum products."

The importance of additional refinery capacity in the Eastern Hemisphere was stressed by Bartlett who said that if the United States loses its Middle-East imports "this might necessitate rationing, far deeper than ever before." This is based upon the assumption that the United States would continue to supply the Marshall plan countries with petroleum and its products, he said.

"It is vitally important," Gulf's vice president explained, "not only to the people in other parts of the world but also to us in the United States that refineries be set up at points in Europe or elsewhere to operate on crude from the Eastern Hemisphere. Only by so doing can an ample quantity of petroleum products be made available to those countries for improving their economic life."

Oil Program Adopted By Philippine Government

Exploration and development permits will be issued by the Philippine Government for a 25-year period, renewable for another 25 years, to "any qualified party," according to an announcement made in Manila.

Exploration areas will be limited to 1,000,000 hectares (2,470,000 acres) after which a company or individual will select an area not exceeding 500,000 hectares (1,250,000 acres) for development.

Approximately one-third of the 15,000,000 hectares (37,500,000 acres) is believed to constitute potential oil-bearing areas. *(For more information see The Oil and Gas Journal, June 10, page 55).*

Swiss Imports Cost More

Switzerland's gasoline imports amounted to 201,000 tons, or approximately 4,020 bbl. daily, last year. This is about the same quantity as was imported in 1938. However, the cost to Switzerland increased by 53 per cent.

Diesel oil imports jumped from 30,000 tons, approximately 600 bbl. daily, in 1938 to 57,000 tons, approximately 1,140 bbl. daily, in 1947. Costs for diesel imports increased by 64 per cent.

International

ERP Oil Approvals Already Pass $100 Million Mark

WASHINGTON. — The Economic Cooperation Administration has authorized the procurement of nearly $30,000,000 worth of petroleum products by Marshall-plan countries, bringing total European recovery program authorization for oil to $104,121,857 as of June 26.

The latest schedule of authorization shows that French North Africa is to procure $301,000 worth of fuel oil from Iran, Iraq, and Saudi Arabia, and $1,400,000 worth of carbon black in this country, while the Netherlands is to procure $1,067,000 worth of products in the United States, $788,000 of aviation gasoline, kerosine, gas and fuel oil from Venezuela, and $393,000 of motor gasoline, kerosine, and gas oil from Iran and Iraq.

The bulk of the authorizations, however, were for United Kingdom, which is to procure $2,336,680 worth of aviation gasoline, $4,437,660 of motor gasoline, $1,237,490 of gas oil, $615,050 of white spirit, and $7,471,000 of lubricating oils in the United States; and $93,680 worth of aviation gasoline, $938,370 motor gasoline, $262,950 gas oil, $5,102,940 fuel oil, $194,000 kerosine, and $3,161,520 crude oil from Saudi Arabia, Iran and Iraq.

Anglo-Iranian Revises Crude Production Figures

Total annual Iranian crude-oil production of the Anglo-Iranian Oil Co., Ltd., for 1947 amounted to 20,194,838 tons, or approximately 415,000 bbl. daily. This is the company's revised figure which differs only slightly from the provisional figure of 20,000,000 tons released in February.

Output for last December totaled 1,902,838 tons, or about 460,000 bbl. daily. This compares with the December 1946 production of 1,684,551 tons, or around 408,000 bbl. daily.

Crude-oil production from the company's oil fields in the United Kingdom last year amounted to 47,200 tons or 967 bbl. daily. The 1946 U.K. production was 55,387 bbl. or 1,140 bbl. daily.

Austrian Strike Reported

Russian authorities in Austria are reported to have discovered new crude-oil areas at Gaenserndorf and Matzen in eastern Austria. Additional drilling is also said to be going on at Niedersalz where large stretches of land reportedly have been confiscated.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

$20,000 for a Policy

WASHINGTON.—The House interstate commerce committee is going to have to make its recess investigation of national fuel policy on a mere $20,000, instead of the $35,000 asked by Chairman Charles A. Wolverton of New Jersey, and since the Eightieth Congress appropriated close to $2,000,000 for investigating committees it can't claim that cutting off that last $15,000 was much of an economy.

Between now and next January, the committee is going to have to "formulate and recommend a national fuel policy adequate to meet the needs of the United States in times of peace and war, including recommendations for a national petroleum policy and the integration of such policy with policies relating to other fuels and energy resources except atomic energy; and for such purposes the committee shall study the current and future fuel supply and demand of the United States and shall study methods of encouraging needed developments to assure the availability of fuels adequate for an expanding economy and the security of the United States," and to do that may go anywhere in the world that its $20,000 will carry it.

As the session drew toward a close a rash of investigatory resolutions covered House and Senate, many of which seemed to call for more or less traveling on the part of committee members, some of whom will have to pay their own expenses if they want to do any traveling after next January 3.

While none of these resolutions was turned down after it reached the floor, the situation finally prompted Rep. Sam Rayburn of Texas, minority leader in the House, to protest that this Congress had probably appropriated more for investigations than he had ever known to be so appropriated in any 10-year period.

Political Promises

INCLUSION in the Republican platform adopted at the Philadelphia convention last week of a plank favoring return of the tidelands to states put government officials in Washington on notice not to make any plans for administration of the California submerged oil lands.

Quite a few of the Republican planks dealt with matters of interest to the oil industry—a pledge to abolish overlapping and duplication of government, tax relief and a better distribution of tax fields between the federal and state governments, encouragement of small business, improvement of labor-management legislation, an adequate privately operated merchant marine, conservation of national resources, and development of synthetic fuels.

Many of the planks in any political pla form are nothing more than the usual assurances that the party will work for everybody if put into power, but the inclusion of statements on tidelands and synthetic fuels is an acknowledgment that these are questions which must be dealt with, since both were brought into prominence by the present administration.

When it comes time for the Democrats to write their program, they won't be able to make much of a point out of synthetic fuels but they undoubtedly will challenge the Republicans on the question of the tidelands, and thus make it one of the issues of the coming campaign. From the standpoint of the Democrats it will be a matter they can argue most effectively in the inland states, which they will assure need not fear seizure of their river or lake beds, but the Republicans probably will hammer on it all over the country.

Mostly, party platforms are merely the frosting on the cake, and frequently the cake is much less palatable than advertised.

Steel Is Drafted

A FEW lines written into the draft bill by the House may mark the end of all efforts to write voluntary agreements for the allocation of steel to consuming industries, including the oil industry.

Those few lines empower the President to require producers of steel to make steel available to persons having orders from the armed forces for materials requiring the metal, and to give priority to such requirements. In the event a steel company refused to comply with these provisions, the Government could seize its plant and the responsible heads of the company could be sent to prison for up to 3 years and fined up to $50,000.

The steel-allocation provisions were inserted in the bill to support other provisions with respect to the placement of orders by the armed forces, requiring their acceptance at a fair price for delivery on a priority basis, and providing similar penalties for refusal.

Government officials concerned with the negotiation of voluntary agreements conceded that the draft-bill provisions are likely to handicap efforts to get a steel-allocation program accepted by the steel industry, largely because the steel producers so far have no idea of the magnitude of military requirements under the expansion program nor how soon its impact will be felt and, therefore, will be reluctant to commit themselves to any programs they may not be able to carry out.

While the oil industry and the Interior Department would like to get the allocation program urged by the National Petroleum Council committee, it is agreed that discussions of the matter itself have probably accomplished a great deal in bringing the steel industry to a realization of oil's needs.

In meetings with the Office of Industry Cooperation, steel producers have given assurances that oil-country tubular goods requirements will be satisfactorily met and that they would make maximum use of all their pipe-making facilities. The difficulty in getting an agreement lies in the other fields of oil-industry requirements, which clash head-on with the needs of other industries, but Interior officials feel that if the industry continues to get steel at its present rate the situation will not be too bad even in the absence of an official commitment.

Under the draft law, the steel producers would be required to meet the needs of defense contractors before making shipments to other customers, regardless of any voluntary agreements. Military requirements have been estimated at anything from 1 per cent of total output up, but it is pointed out that while these requirements might be small percentagewise, in the case of some mills the proportion of defense shipments might be very substantial and could, for instance, cut deeply into their supply of tubular goods for other customers.

Surplus Musical Chairs

HAVING failed to solve the problem of disposing of surplus war goods and property through a series of five agencies, Congress has developed a new idea and has ordered dissolution of the War Assets Administration February 28 and transfer of all surplus to the Reconstruction Finance

Corp., Department of the Air Force, and Bureau of Federal Supply.

Since 1944, the disposition of surplus property has been tackled successively by the Surplus War Property Administration, Surplus Property Board, Surplus Property Administration, War Assets Corp., and War Assets Administration. The last had the longest tenure of any, 2 years, but none distinguished itself as a selling agency and as each successive organization inherited policies and practices established by its predecessors the procedure finally became so cumbersome that WAA practically bogged down.

There is considerable doubt whether WAA even knows exactly how much surplus it is holding for disposal. Its figures show holdings that originally cost the Government about $4,200,000,000, of which $2,685,000,000 is in the form of real property—plants and land—but some members of Congress who have studied the matter say the figure is really around $7 billion, $5 billion of it real property.

Under the new setup, real property, including plant facilities of interest to the oil industry, will be turned over to the RFC, aircraft and parts to the Air Force, and everything else, including petroleum equipment, to the Bureau of Federal Supply. One of the byproducts of this division will be the exposure of the real property to state and local real estate taxes since the RFC does not enjoy the Government's exemption from taxation, and this, it is charged, will more than offset the savings at which Congress is aiming. An appropriation of $65,000,000 is provided to carry WAA through until it is dissolved, as against $107,000,000 sought by the agency, but it is said the taxes on real property will run to considerably more than the difference.

But while Congress is seeking to speed up the disposition of war surplus it will be many years before the books on World War II can be closed. One of the first items of surplus property turned over for disposal when the program began in 1944 was a large quantity of spurs left over from the cavalry of the First World War.

Congressman Fails to Halt Allocation Plan as Objectors Duck Expose

WASHINGTON. — Interior Department officials last week refused to hold up consideration of the industry's voluntary agreement until Congressman Walter C. Ploeser of Missouri could investigate complaints which he said had been filed with the House small business committee, of which he is chairman, that the draft considered at the June 18 public hearing did not protect small independent distributors.

Ploeser, who had called a number of oil-country executives and independent jobbers and dealers to meet with the committee June 26, was told by Acting Secretary of the Interior Oscar Chapman that full opportunity to be heard had been offered at the June 18 hearing, at which the Congressman and those filing complaints with him could have appeared and spoken their mind.

If the Congressman had any comments or suggestions to make regarding the agreement, they would be given full consideration, Chapman said, but the orderly procedure would not be interrupted. The agreement now is in the Secretary's office for approval and transmission to the Department of Justice for clearance.

The principal objector to the agreement as originally drafted for the public hearing was Rankin P. Peck, president of the National Congress of Petroleum Retailers and a member of the industry advisory committee appointed by Secretary Krug, who was represented at the hearing by his attorney. Peck also filed his protest with the Senate and House small business committees, and Sen. Kenneth S. Wherry of Nebraska, chairman of the former, wrote Krug a letter in advance of the hearing.

The basis of Peck's opposition was the failure to stipulate clearly in the agreement that equitable distribution was to apply to all customers "at all marketing levels." An amendment incorporating that term was accepted by B. I. Graves, chairman of the advisory committee, and accepted as essential by Max Ball, chairman of the Oil and Gas Division, who presided. Wherry later expressed satisfaction with this action, but Ploeser, whose committee had been practically hibernating throughout the session of Congress, elected to make it the subject of investigation.

The hearing was held June 26, as scheduled, but the committee found the fishing poor.

Surrounding the proceedings with an air of secrecy which involved the withholding of the names of witnesses until they appeared to testify, lest they be "intimidated," Chairman Ploeser found his big-shot witnesses, Eugene Holman, Dr. Robert Wilson, and Sidney Swensrud, had written in they favored the agreement and declined to testify.

Several independent distributors did testify, but as in the case of the hearing held by the Interior Department, they differed on the desirability of the agreement, presenting the same arguments they had put forth previously.

A number of distressed distributors were unwilling to appear before the committee because they feared retaliation from their suppliers, Ploeser explained.

Mineral Rights on Surplus Federal Lands Are Frozen

WASHINGTON.—In one of its last-minute actions rushed through just before adjourning, Congress ordered the Secretary of Agriculture to hold on to mineral interests reserved by the Government in lands sold prior to August 15, 1946, under the Bankhead-Jones Farm Tenant Act, until it can make a further study of their disposition next year.

Under legislation enacted in 1946, the Secretary was required to include all mineral rights in the sale of lands formerly administered by the Farm Security Administration, and was given 18 months in which to dispose of other assets, including the 75 per cent of the minerals reserved under sales prior to that time. If not disposed of within 18 months these assets were to be transferred to appropriate agencies for disposition as surplus property.

The 1946 legislation, however, gave no clear-cut instructions as to the manner of handling reserved mineral rights and the Secretary of Agriculture took no steps to dispose of them during the 18-month period which expired last February 14.

The current legislation was aimed at blocking the transfer of these rights for disposition as surplus property, it being pointed out by committees in charge of the measure that there was grave doubt whether such disposition would best serve the interests of the Government.

Stanolind Promotes Three

Ralph O. Dietler, president of Stanolind Oil Purchasing Co. since 1940, was named chairman of the board at a directors' meeting June 29. A. C. Sailstad, executive vice president, was elected president, and D. L. Wolfe, manager of the executive department, was made vice president and a director.

NPC Called for July 29

WASHINGTON. — National Petroleum Council Chairman Walter C. Hallanan this week set July 29 as the date for the next meeting of the Council.

Army Starts Survey of Suitable Sites for Building Synthetic-Fuels Plants

WASHINGTON.—A nation-wide survey of possible sites for the erection of synthetic liquid-fuels plants was put under way last week with award by the Army's engineer corps of a $110,000 contract to the New York engineering consultant firm of Ford, Bacon & Davis, Inc., to make sample studies in western Kentucky, northwestern Colorado, and southeast Texas.

These areas were selected because, respectively, they have large known supplies of coal, oil shale, and natural gas from which synthetic fuels can be made.

The study will be completed within 4 to 6 months and, if funds are available, will be followed by a survey of the remaining areas of the country where the basic raw materials are known to exist, which probably will require about 18 months.

The intention of the military to pinpoint the areas suitable for the establishment of synthetic fuels plants was made known to Congressional committees earlier this year in the course of hearings on a synthetic liquid-fuels program, but it was then stated, and repeated last week by Gen. R. A. Wheeler, Chief of Engineers, that the survey is not intended to designate specific sites for plants or determine the total coal,

Technical Men of Indiana Standard Group Gather for Big Conference

TECHNICAL staff conferences of large oil companies are becoming the accepted method for coordinating research and exchanging information on technical problems, but one of the largest of such meetings ever held was that of Standard Oil Co. (Ind.) and subsidiaries at French Lick, Ind., recently.

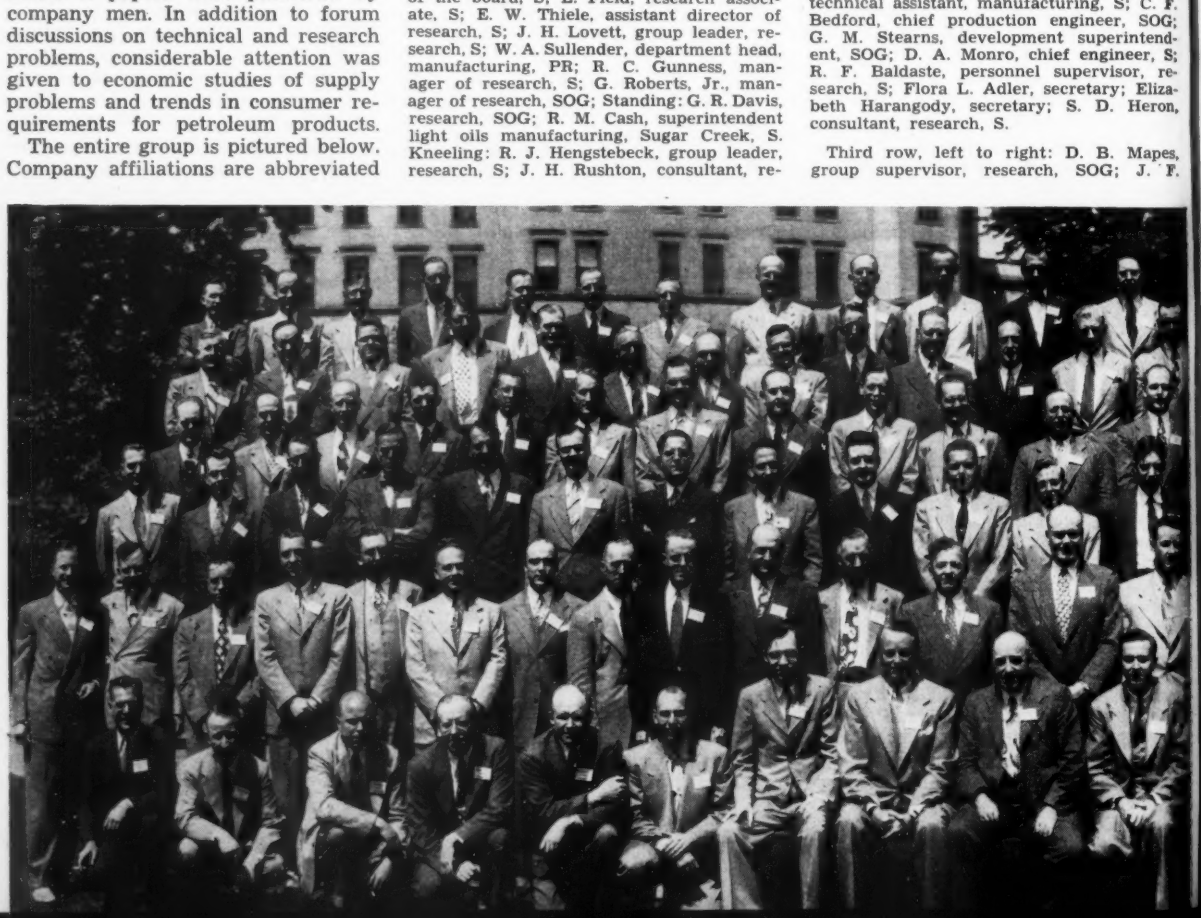
For this meeting the company brought in 225 of its technical men from all branches of the industry. The conference lasted for 6 days, and 84 scientific papers were presented by company men. In addition to forum discussions on technical and research problems, considerable attention was given to economic studies of supply problems and trends in consumer requirements for petroleum products.

The entire group is pictured below. Company affiliations are abbreviated as follows: A—American Oil Co.; PP—Pan American Petroleum Corp.; PR—Pan American Refining Corp.; R—Root Petroleum Co.; S—Standard Oil Co. (Ind.); SOG—Stanolind Oil & Gas Co.; U—Utah Oil Refining Co.

First row, left to right: R. F. Marschner, section leader, research, S; W. G. Whitman, consultant, research, S; M. H. Arveson, senior technologist, chemical products, S; B. L. Evering, group leader, research, S; J. K. Roberts, general manager of research, S; A. L. Conn, section leader, research, S; A. W. Weitkamp, research, S; B. K. Brown, vice president, S; R. E. Wilson, chairman of the board, S; E. Field, research associate, S; E. W. Thiele, assistant director of research, S; J. H. Lovett, group leader, research, S; W. A. Sullender, department head, manufacturing, PR; R. C. Gunness, manager of research, S; G. Roberts, Jr., manager of research, SOG; Standing: G. R. Davis, research, SOG; R. M. Cash, superintendent light oils manufacturing, Sugar Creek, S. Kneeling: R. J. Hengstebeck, group leader, research, S; J. H. Rushton, consultant, research, S; M. T. Carpenter, executive director of Whiting laboratories, research, S; C. R. Harte, superintendent of technical service, Whiting, research, S.

Second row, left to right: R. A. Steel, section leader, research, S; J. E. Latta, group supervisor, research, SOG; A. J. Pettigrove, chief mechanical engineer, manufacturing, SOG; T. A. Abbott, executive director, engineering research, S; H. M. Steininger, chief chemist, Sugar Creek, S; I. R. Brenholdt, engineering research, S; G. W. Watts, director of engineering, S; W. G. Guild, acting assistant chief engineer, oils design department, engineering, S; R. J. Diwoky, superintendent projects division, manufacturing, S; F. R. Clark, refinery manager, U; B. H. Shoemaker, assistant director of research, S; F. H. Blunck, general foreman, manufacturing, S; C. E. Evans, general foreman, manufacturing, S; P. L. Brandt, assistant director of research, PR; N. Fragen, assistant director of research, S; W. P. Hilliker, lubrication engineer, sales, PP; W. H. Bahlke, research coordinator, S; A. F. Endres, assistant general superintendent, manufacturing, Whiting, S.; C. A. Cogan, technical assistant, manufacturing, S; C. F. Bedford, chief production engineer, SOG; G. M. Stearns, development superintendent, SOG; D. A. Monro, chief engineer, S; R. F. Baldaste, personnel supervisor, research, S; Flora L. Adler, secretary; Elizabeth Harangody, secretary; S. D. Heron, consultant, research, S.

Third row, left to right: D. B. Mapes, group supervisor, research, SOG; J. F.



natural gas, and oil-shale reserves of the United States, but merely to determine general areas where the requirements for one or more plants can be met.

The indications are that, regardless of the outcome of the November elections, legislation will be pressed in Congress next year to get a synthetic liquids-fuels industry running, probably along the lines of the Wolverton bill which got as far as the House rules committee last session on a favorable report from the interstate commerce committee.

The Wolverton bill—substituted for an Administration proposal for construction of plants by the Government—provided for 30-year loans by the Reconstruction Finance Corp. for plant construction, operating subsidies where necessary, and financial assistance to industry to accelerate research and development, with plants using coal or shale to be constructed by the RFC under contracts with private industry in the event industry lagged.

The Army's survey would fit into this plan by shortening the time and eliminating the expense to industry of selecting sites for plants.

"The over-all federal program," it was explained in announcing the contract, "is being undertaken to make possible the rapid provision—preferably by private industry—of an added source of liquid fuel supplies to help meet unprecedented peacetime demands and offset the acute shortage that would be occasioned by a national emergency. The National Military Establishment has a direct interest in the development of synthetic fuel production since it has been estimated that an additional 2,000,000 bbl. of oil daily would be required for civilian and military needs in this country in the event of an emergency of the magnitude of World War II."

Snuggs, section leader, research, S; S. W. Walker, process research supervisor, SOG; W. B. Plummer, manager, chemical products, S; F. J. Smith, head, chemical department, PR; W. D. McEachron, production department, S; M. F. Brown, production department, S; D. B. Edwards, chief gas engineer, SOG; J. E. Swearingen, development superintendent, manufacturing, SOG; C. W. Peters, group leader, research, S; R. L. Meuleners, research, PR; E. L. d'Ouville, senior technologist, development and patent, S; J. C. Stauffer, patent adviser, Whiting, S; M. Gordon, group leader, research, S; C. M. Loane, section leader, research, S; J. B. Hamblen, general manager, manufacturing, PP; J. E. Seebold, assistant director of research, S; R. N. Giles, director of technical service, research, S; C. W. Nysewander, technical service, U; L. T. Wright, associate director, engineering research, S; J. M. Miller, head, automotive division, sales technical service, S; M. D. Gjerde, manager, sales technical service, S; G. H. Weisemann, research, S; T. H. Rogers, director of research, S.

Fourth row, left to right: H. M. Grubb, group leader, research, S; R. B. Selund, group leader, research, S; R. Mungen, group supervisor, research SOG; R. J. Lee, section head, research, PR; W. T. Herget, department head, manufacturing, PR; H. A. Heiss, general foreman, manufacturing, S; J. E. Kasch, section head, research, PR; D. W. Bransky, group leader, research, S; C. F. Feuchter, research, PR; D. E. Bruce, group leader, research, S; A. A. Corona, vice president, Pan American Petroleum & Transport Co.; R. C. Mallat, research, S; W. F. Meehan, assistant superintendent of technical service, Whiting, S; W. L. Leavitt, senior analyst, distribution economics, S; S. B. Becker, development and patent, S; E. G. Wiley, superintendent, asphalt division, manufacturing, Whiting, S; J. B. Clark, production research supervisor, SOG; W. F. Johnston, research, PR; N. T. Robey, general foreman, manufacturing, Wood River, S; E. B. Tucker, section leader, research, S; J. C. Bailie, assistant chief chemist, Whiting, S; D. Silverman, exploration research supervisor, SOG; R. H. Price, director of research, PR; J. O. Howe, technical assistant, research, S; F. A. Gitzendanner, associate director, engineering research, S; E. L. Gordy, assistant to the general manager, research, S.

Fifth row, left to right: A. W. Neeley, chief chemist, U; A. C. Hershey, chief chemist, Wood River, S; H. M. Hart, group leader, research, S; R. C. Schofield, research, PR; D. H. Pollock, pipe line, U; A. T. Milbrook, assistant chief engineer, utilities design department, engineering, S; W. B. Mathews, assistant chief engineer, S; P. R. Schultz, manager, economics department, SOG; R. V. Shankland, group leader, research, S; S. A. Montgomery, assistant general manager, manufacturing, S; P. H. Sullivan, manager, development and patent, S; D. P. Barnard, research coordinator, S; H. A. Parker, group leader, research, S; J. G. Hunter, general foreman, manufacturing, S; P. L. Vander Jagt, senior analyst, distribution economics, S; W. R. Remalia, senior analyst, distribution economics, S; D. A. McCaulay, research, S; G. L. Taylor, research geologist, SOG; J. A. Ridgway, section head, research, PR; W. R. Hertwig, group leader, research, S; G. T. Moore, group leader, research, S; R. A. Feagan, process engineering supervisor, SOG; R. A. Carter, general superintendent, gas department, manufacturing, SOG; E. A. Johnson, development and patent, S; W. M. Dudley, associate director, engineering research, S; C. W. Brackin, research, S.

Sixth row, left to right: A. B. Brown, senior research associate, S; H. V. Knight, group leader, research, S; E. K. Brown, chief chemist, Casper refinery, S; J. B. Duckworth, assistant director of research, S; D. G. Zink, superintendent, chemical products, SOG; R. A. Swenson, research, S; R. M. Eberly, manager, coordinating division, distribution economics, S; L. F. Peterson, assistant chief production engineer, SOG; J. W. Bertetti, chief engineer, R; P. F. Miller, research, PR; P. Hurd, engineering, PR; P. Hill, group leader, research, S; T. B. Tom, group leader, research, S; H. S. Haworth, assistant chief engineer, plant engineering department, engineering, S; W. Kaplan, section head, research, PR; P. F. Hawley, patent supervisor, research, SOG; K. Dyk, chief geophysicist, SOG; G. W. Flint, section leader, research, S; E. W. Adams, assistant director of research, S; H. B. Higgins, production department, S; R. L. Baldner, economics, SOG; J. M. Stuckey, research, PR; J. W. Boatwright, general manager, distribution economics, S.

Military Ask Help in Filling Oil Needs

WASHINGTON.—The Armed Services Petroleum Board last week called on the military and government petroleum requirements committee of the National Petroleum Council for assistance in securing tenders of bady needed gasoline, diesel, and Navy special fuel oil.

The board is approximately 1,000,000 bbl. short on its requirements of the two top grades of aviation gasoline for the next 6 months but has offers of more than it needs of the two lowest grades, it was disclosed by Howard W. Page, acting chairman of the NPC committee.

About 724,000 bbl. of 100-130 grade has been offered which does not meet the 10 per cent aromatic specification, Page said, and efforts are being made to use it by blending with toluene.

Much of the board's difficulty, Page revealed, is due to the feeling of individual suppliers that they are not justified in contracting for their estimated maximum production because of possible unexpected shutdowns and other factors which might cause actual operations to vary from estimates.

For the coming 6 months the ASPB requires 3,246,000 bbl. of 115-145 and has offers of 2,795,000; 7,215,000 bbl. of 100-130 with offers of 5,966,000 bbl. plus 724,000 not meeting the aromatics specifications; 629,000 bbl. of 91-98 with offers of 921,000; 78,000 bbl. of 80 grade with offers of 104,000; and 1,376,000 bbl. jet propulsion fuel, with offers of 1,407,000.

With respect to motor gasoline, the board has requested 2,000,000 bbl. for cargo lifting on the West Coast and has been offered only 600,000, while a call for 4,090,000 bbl. for cargo lifting in the Gulf-East Coast-Caribbean has brought offers of 1,263,000 bbl.

A call for 2,088,000 bbl. of diesel oil on the West Coast has brought offers of 1,320,000, but none for the 313,000 Army Grade A included in the call. A call for 2,629,000 bbl. in the Gulf-East Coast-Caribbean brought tenders of 1,850,000 bbl.

In Navy special fuel oil, 4,642,000 bbl. has been offered on the West Coast against a call for 5,930,000, and 2,520,000 in the Gulf-East Coast-Caribbean against a call for 2,776,000 bbl.

Sunray Buys Lawson Properties in Texas

Sunray Oil Corp. has purchased 12 producing oil wells in Hockley County, Texas, on leases covering about 2,100 acres from Edward C. Lawson, Tulsa, an independent operator. Each well has an allowable of 40 bbl. daily The wells are producing in the San Andres limestone section at about 5,000 ft.

The new production will be used by Sunray to increase the throughput at its refinery at Duncan, Okla., where the company's large catalytic cracking unit recently went on stream.

Sunray plans an extensive drilling program on the newly acquired properties, and operations will be carried out by the company's North and West Texas division, with headquarters at Midland, Tex.

A thirteenth well is being drilled and is nearing completion. Twelve additional wells will be drilled on the acreage before the end of this year, according to company officials.

Deep Rock and Derby Buy Sloan & Zook Co.

Deep Rock Oil Corp., Tulsa, has purchased more than 75 per cent of Sloan & Zook Co. with Derby Oil Co., Wichita, Kans., buying the remaining stock. Total stock of the newly acquired company is reported to be approximately $10,500,000.

Production of Sloan & Zook Co. is approximately 3,200 bbl. daily, and its property includes 3,124 water and gas intake and producing wells. Before acquiring the major portion of Sloan & Zook interests Deep Rock's crude - oil production amounted to slightly more than 7,000 bbl. daily.

Properties of the recently purchased company are located in the Eastern Kansas water-flooding area, in the Foster and Wasson pools of West Texas, in Wichita County, North Texas, and Cotton and Washington counties, Oklahoma.

Both Deep Rock and Derby have refineries located close to the producing as well as the undeveloped acreage. Deep Rock's Cushing, Okla., refinery has a capacity of 12,000 bbl. daily.

Tompson Made President of Bethlehem As Other Officials Are Promoted

CHANGES in the top management of Bethlehem Supply Co., Tulsa, have been announced by A. B. Homer, president of the parent Bethlehem Steel Corp. and until now also president of the oil-field subsidiary.

G. A. Tompson, who has been vice president of the supply company for several years, becomes president. Other promotions in Bethlehem Supply include: C. R. Zimmerman, assistant to the vice president, sales department, to executive vice president; J. F. Eaton, manager of the Tulsa plant, to vice president in charge of manufacturing; and I. C. Smith, manager of the Corsicana, Tex., plant, to general manager of sales.

G. A. TOMPSON

C. R. ZIMMERMAN

J. F. EATON

I. C. SMITH

Former Oil Man

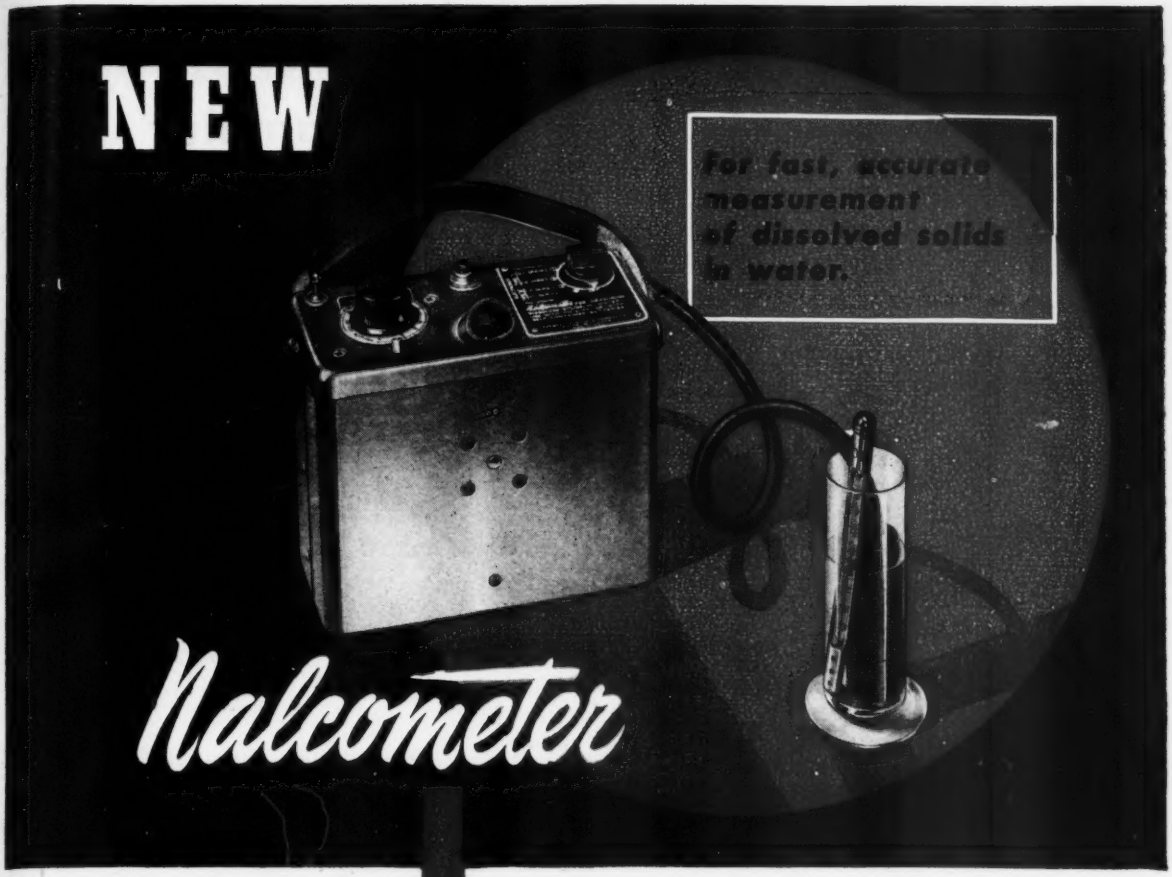
Prior to joining Bethlehem Supply Tompson was with Cities Service Oil Co. for 20 years; during the last 12 years of that period he was purchasing agent. He has been an executive of Bethlehem Supply since its formation in 1937, serving first as vice president in charge of sales and later becoming vice president and general manager. Tompson, whose entire business career has been spent in the oil industry, is a native of Missouri. He attended the University of Missouri.

Zimmerman joined Bethlehem Steel in 1927 and served as assistant chief inspector in the pipe mills. He was transferred to the sales department at Bethlehem, Pa., in 1938. In 1947 he was appointed assistant to the vice president, sales department.

Eaton joined Bethlehem Supply in 1939 as chief engineer of the Tulsa plant and became plant general manager the following year. Before going with Bethlehem Supply he had been district manager of sales at Houston for Jarecki Manufacturing Co. A graduate of Princeton University in 1931 Eaton has also been with Aluminum Co. of America and American Steel Derrick Co.

Smith joined Bethlehem Steel in 1935 following his graduation from Lehigh University. He served in several capacities in the machine shops, and forge and treatment departments. In 1945 he was appointed manager of the Corsicana plant.

NEW



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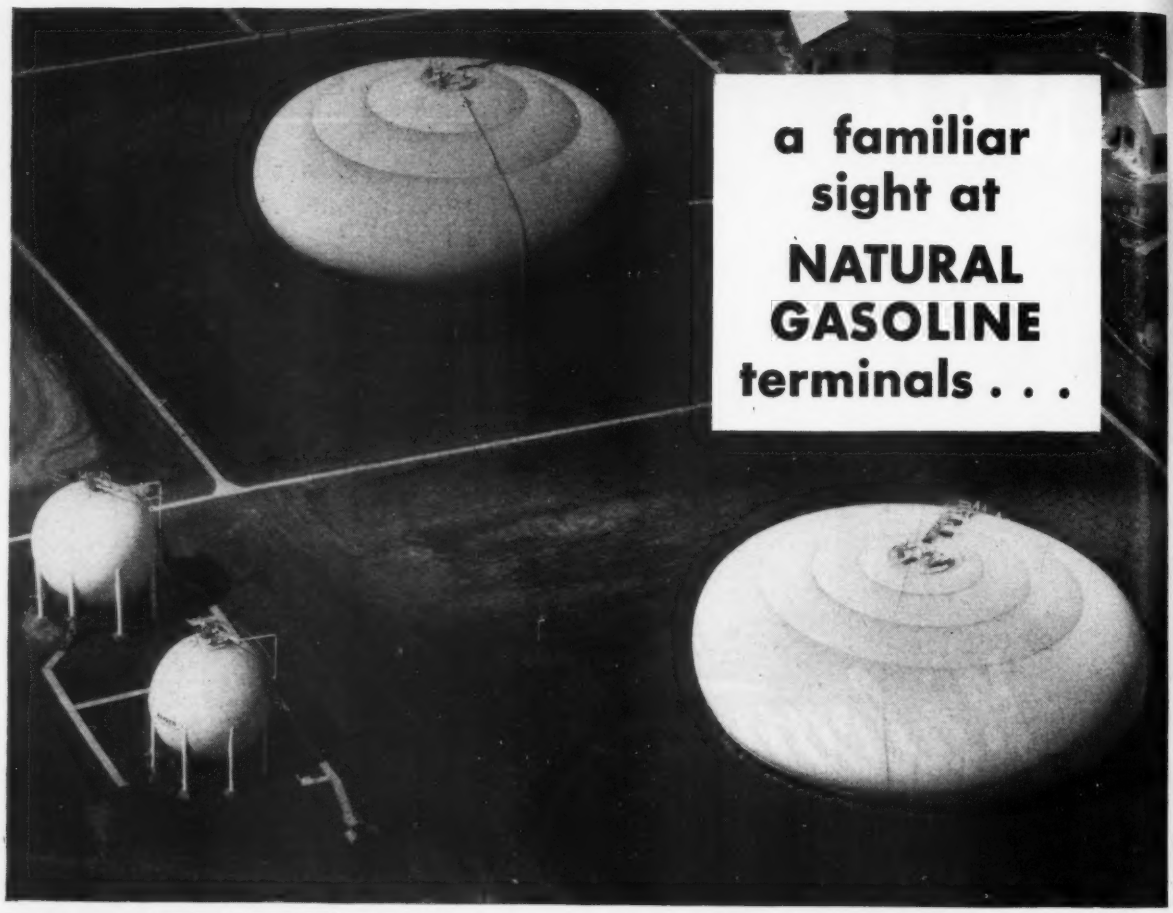

HORTONSPHERES and HORTONSPHEROIDS

The view above is just one example of many similar Hortonsphere and Hortonspheroid installations for butane and natural gasoline storage. This particular group of tanks is located at the Warren Petroleum Corporation's Houston terminal.

Some of the reasons why Hortonspheres and Hortonspheroids are so widely used for the storage of volatile liquids are:

. . . *The Hortonsphere* is the logical container for storing butane, butane-propane mixtures, refinery charging stocks, and the more volatile grades of natural gasoline. It is economical to build because its spherical shape utilizes material to the best advantage. The Hortonsphere prevents filling and emptying losses. The vapor space in a Hortonsphere contains little or no oxygen, which reduces the fire hazard and cuts down corrosion on the inside of the shell. The entire shell of a Hortonsphere is accessible, making it easy to inspect and maintain. Standard sizes are available up to 65 ft. in diam. for pressures up to 50 lbs. per sq. in., and in smaller sizes for pressures as high as 150 lbs.

. . . *The Hortonspheroid* is recommended for storing motor gasoline and natural gasoline requiring pressures of 30 lbs. per sq. in. or less. Built in standard capacities up to 120,000 bbls., these efficient pressure storage tanks offer protection from evaporation, a reduction in fire hazard, and require only normal maintenance.

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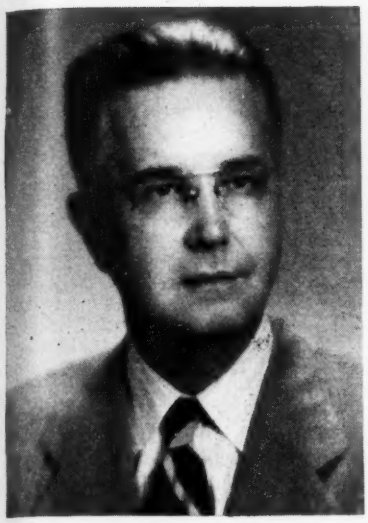
Cleveland, 15 ..... 2204 Guildhall Bldg.
Los Angeles, 14 ..... 1423 Wm. Fox Bldg.
Atlanta, 3 ..... 2154 Healey Bldg.
Birmingham, 1 ..... 1536 North 50th St.
Tulsa, 3 ..... 1606 Hunt Bldg.
Houston, 2 ..... 2119 National Standard Bldg.
Philadelphia, 3 ..... 1615-1700 Walnut Street Bldg.
Havana ..... 402 Abreu Bldg.
San Francisco, 11 ..... 1254-22 Battery Street Bldg.
Detroit, 26 ..... 1514 Lafayette Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Compania Tecnica Industrie Petroli, S.A.I., Rome, Italy
Leopoldo Sol & Cia., Reconquista 558, Buenos Aires, Argentina
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Chicago Bridge & Iron Company, Limited, Apartado 1348, Caracas, Venezuela

PERSONALS



Zachry Is Again Named Southern Union President

CLARE H. ZACHRY, president, Southern Union Gas Co., was re-elected to that position for his fourth consecutive term. Zachry was also awarded the company's thirty-fourth 15-year service emblem for continuous service with the company. During this time he progressed rapidly as the company expanded. At the time the board of directors renewed his presidency, an announcement was made of a proposed $5,000,000 exploration and development program for the ensuing year, in the San Juan Valley of New Mexico, where Southern Union is particularly active.

Zachry was previously a partner in a firm of public accountants who handled Southern Union's books. In that connection he became familiar with many phases of the organization with which he was later associated, so that within a few days after joining the firm he was named secretary and treasurer. Six months later he became vice president and treasurer, and a director. In April 1943 he was elected executive vice president. Two years later he was named president, succeeding Wofford Cain, one of the organizers of the company and now chairman of the board.

Zachry, who makes his home in Dallas, is known throughout the gas industry for his service on numerous boards and committees of various associations. He is a member of the board of directors, American Gas Association, as well as a member of its management committee, natural gas department. He is on the board of directors and membership committee of the Independent Natural Gas Association of America; a member of the executive committee of Southern Gas Association, and a past president of the association.

Lloyd Graham, superintendent for Falcon-Seaboard Drilling Co., at Wellington, Kans., is on special assignment at New Martinsville, W. Va.

George H. Daggett, vice president of Phoenix Oil Co., Bradford, Pa., has been elected president of the Pennsylvania Oil Producers Association, Bradford district, to succeed **Archie L. Yerdon.**

L. W. Reynolds, formerly of Longview, Tex., has been named field superintendent at Andrews, Tex., for Stanolind Oil & Gas Co. to succeed **C. R. Nichols** who has been moved to Sundown, Tex.

Fred E. Forster, Jr., recently graduated from the University of Texas in chemical engineering, has joined Thompson-Carr, Inc., drilling contractors and oil operators, as field engineer.

DR. R. F. FAULL

Dr. R. F. Faull, supervisor of refinery technology and technical service division at the Richmond laboratories of California Research Corp., has been appointed to the newly created position of manager of the company's La Habra, Calif., oil field research laboratory. California Research is a subsidiary of Standard Oil Co. of California. The two oil field research units at Whittier and La Habra are being combined into one organization under Faull's direction, with headquarters at La Habra. Faull will be directly responsible to **Earl G. Gaylord,** vice president in charge of oil field research for the company. Assisting Faull will be **Walter C. Dayhuff,** who has been named technical assistant in charge of administrative functions and surface processing research, and **Dr. M. B. Standing,** division supervisor in charge of research and drilling and production.

Frank M. Racher, for the past 8 years connected with oil operations in Brazil and Peru, has returned to Petrolia, Ont., on several month's furlough from Lima, Peru.

Dr. Courtney C. Brown has been appointed assistant head of the coordination and economics department of Standard Oil Co. (N. J.)

Arthur W. Clinger, formerly purchasing agent for Pennzoil Co., Oil City, Pa., has been named secretary to succeed **Robert A. Browne,** who retired July 1.

Reese H. Tucker, who resigned in 1944 from Cities Service Oil Co., Bartlesville, Okla., to form Tucker Exploration Co., Tulsa, of which he is president, has again joined Cities Service to fill the newly created post of manager of geophysics for the company at Bartlesville. Tucker first joined Cities Service in 1930 as a junior engineer after graduating in geology from Colorado University. He was assigned to the geological division, where he spent most of his time in geophysical work. Tucker Exploration Co. will be liquidated as soon as contract obligations are satisfied.

A. L. Nickerson, director, Socony-Vacuum Oil Co., Inc., New York, has been named a member of the board of directors of the American Management Association for a term of 3 years.

Fred Ehlers, a general foreman at the Whiting refinery of Standard Oil Co. (Ind.), recently celebrated completion of 50 years' service for the company. He will retire in August at the age of 65.

Leroy H. Wilson and **John Vayda,** both of the Bayonne refinery of Tide Water Associated Oil Co., and **T. Northcutt,** process operator in the company's Avon, Calif., refinery, have been awarded a total of $3,000 for meritorious service and suggestions for improvements in operations during 1947. Northcutt received a $1,500 first prize.

Jack L. Stack, Harry Albert Hess, C. J. Stamas, Edward R. Phillips and **Harley L. Daughters** have joined the engineering staff of the Texas Railroad Commission. Stack will be engineer at Refugio, the others, junior engineers: Hess in Houston; Stamas in Phillips, and Daughters in Kilgore. Other recent changes in the commission's engineering personnel: **John L. Jordan** has been promoted

from junior to senior engineer in Corpus Christi; **Lamar Eschberger,** formerly junior engineer, has been named district engineer in Midland, succeeding **Everett L. Smith** who resigned to open a consulting office in Midland; and **Joseph Orbitson,** junior engineer at Kilgore, who resigned to join Barbeck, Edgerton, Payne & Stearns, Austin.

G. D. Brown, in the production department of Stanolind Oil & Gas Co. at Fort Worth, Tex., has left for Caracas, Venezuela, where he will be materials auditor for Creole Petroleum Corp.

Philo W. Parker, board chairman of Standard-Vacuum Oil Co., has been awarded an honorary degree of doctor of laws by Colgate University. Since graduating from Colgate in 1912 Parker has been in the oil business.

Dr. Frank W. Jessen, during the last year a consulting engineer in Houston, has joined the Austin Area Economic Development Foundation in Austin as chief consulting engineer. The foundation embraces 22 counties and was organized last March to attract suitable industries to the area. Jessen has been associated with Associated Engineers, Inc., and in 1944-45 was a consultant for Petroleos Mexicanos in Mexico. He was in Humble Oil & Refining Co.'s production department previously for 11 years.

Austin T. Foster, general counsel of Socony-Vacuum Oil Co., Inc., has been appointed a member of the American Petroleum Industries Committee of the American Petroleum Institute. He succeeds **George V. Holton,** who was recently elected chairman of the board of directors of Socony-Vacuum.

Carl A. Bently, a graduate in petroleum engineering at the University of Oklahoma, has joined the T. H. McCasland interests at Duncan, Okla.

R. C. Wiles has been elected assistant secretary and appointed office manager of Pan American Pipe Line Co., Houston. He succeeds **W. M. Padgett,** who has resigned.

Walter L. Keefe, general superintendent of the production department in eastern Venezuela for Mene Grande Oil Co., C. A., a wholly owned subsidiary of Venezuela Gulf Oil Co., has been appointed manager of Mene Grande's eastern division with headquarters in San Tome. He succeeds **Robert L. Boggs,** who is temporarily replacing **I. G. Davis,** western division manager, now on vacation. Boggs later will assume other duties with the company. Keefe, who has been with the Gulf companies for 28 years, has served in various capacities in both eastern and western Venezuela. **Cliff W. Perry,** assistant general superintendent for the production department in eastern Venezuela, has been named to succeed Keefe as superintendent. Perry joined Mene Grande as junior geologist in 1934 after graduating from the University of Oklahoma in petroleum engineering. He has advanced through positions of petroleum engineer, chief petroleum engineer, and assistant superintendent of the production department.

Kenneth H. Crandall, vice chairman of the board of directors for California Co., has been elected a director of the Standard Oil Co. of Texas. Both companies are subsidiaries of Standard Oil Co. of California. Crandall joined California Co. in 1925 and later was placed in charge of all geophysical work for that company as well as Standard Oil Co. of Texas. He later was appointed superintendent of exploration for California Co. and in 1942 was elected director and vice president. He became a director and president of California Co. in 1945 and 2 years later was named vice chairman of the board.

William C. Hawks, geologist for Continental Oil Co. at Ventura, Calif., has been transferred to Houston as assistant division geologist.

K. A. Simmons, formerly chief geologist for Kingwood Oil Co. at Oklahoma City, has resigned to join Anderson-Prichard Oil Corp. as division manager of the company's South Texas division with headquarters in San Antonio. Prior to his connection with Kingwood, Simmons was associated with W. C. McBride, Inc., in South Texas and the Illinois basin.

Thomas H. Green, formerly geologist for Shell Oil Co., Inc., in the Oklahoma area, has resigned to join Sunray Oil Corp. as district geologist at the company's Oklahoma City office. Green is a graduate of the University of Colorado in geology and has done post-graduate work at the University of California. **A. M. Wright** has been named district landman at Oklahoma City office, and with Green will coordinate exploration activity in southern and western Oklahoma. **Maurice H. Smith,** formerly with another company in the Oklahoma City district, has been named assistant district geologist there for Sunray. Changes and additions in other Sunray offices include: **Jess P. Roach,** formerly a geologist for a natural-gas company at Corpus Christi, has joined the Midland, Tex., office; **Leland Thompson, Jr.,** formerly of

The broadcasting group, members of the Oil Industry Information Committee, are shown here making a "platter" for a 15-minute program broadcast from Troutdale-in-the-Pines, mountain resort near Denver, Colo., where a party in honor of the O.I.I.C. was held in connection with the committee's 3-day meeting at the Brown Palace Hotel, Denver, June 14-16. (Left to right) Ralph Champlin, Ethyl Corp., New York, chairman of the O.I.I.C.; Paul Hodges, Cities Service Co., New York; Bud Robineau, Frontier Refining Co., Denver, chairman of the Rocky Mountain committee; Joe Lentz, Continental Oil Co., Denver; and G. Stewart Brown, Standard Oil Co. of California, San Francisco

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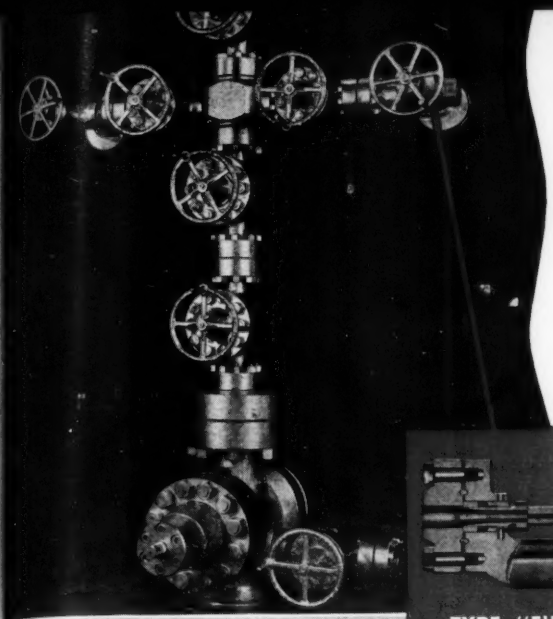
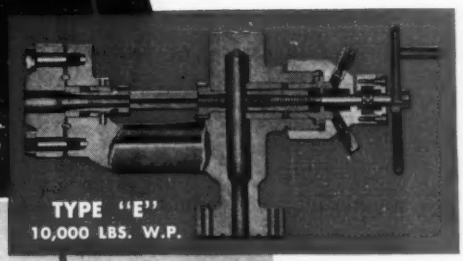
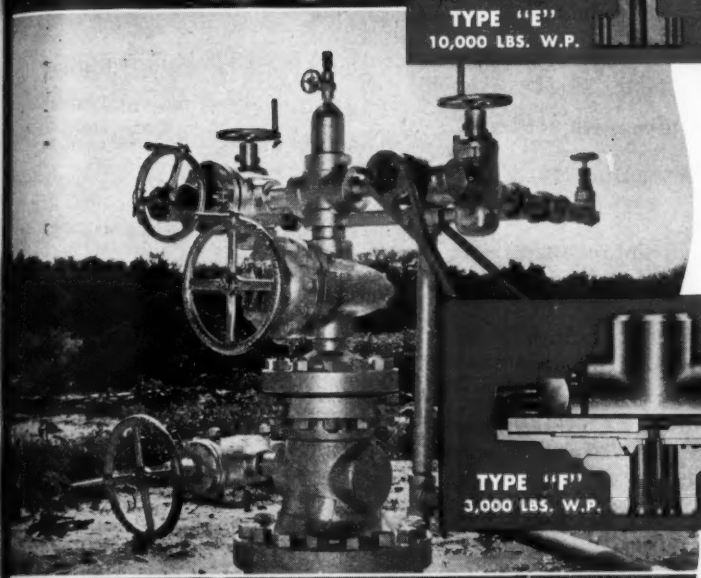
CHRISTMAS TREE FLOW WINGS

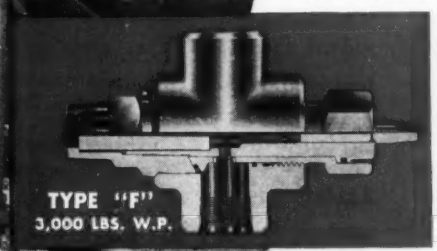
—3 proven styles to choose from



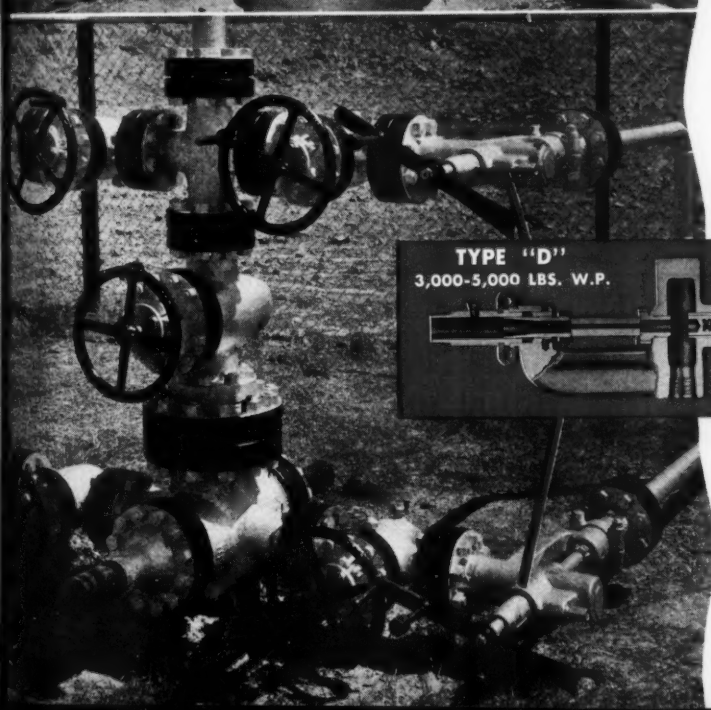


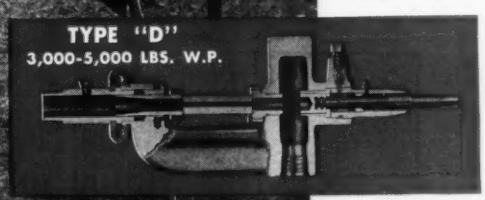
The Cameron Type "E" Flow Wing is designed to safely control the highest well pressures . . . up to 10,000 pounds. It employs essentially the same design as the Type "D" (below) for lower pressures, i.e., wing valve and quick-change positive choke in a single, compact unit, and offers the additional advantages of a ball-bearing stem, plastic packed stem, and extra heavy construction throughout.





The Cameron Type "F" Flow Wing for lower pressures also provides all the fittings required for a Christmas tree wing in a single, compact unit. It is illustrated herewith equipped with a positive choke; however, it may be easily converted to an adjustable choke by substituting a stem for the bleeder plug and inserting a bean with suitable orifice to accommodate the stem.





The Cameron Type "D" Flow Wing, the original unitized Christmas tree wing, is performing satisfactorily on scores of high pressure wells. Its easy-to-operate valve for choke changing, and renewable bean which is out in the open, and therefore, easy to replace, have made it a favorite among production men. An efficient 2-bolt union on the outlet side obviates the need for a union in the flow line.

CAMERON IRON WORKS, INC.

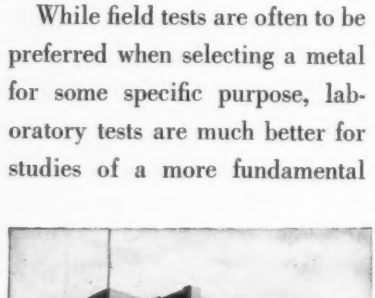
P. O. BOX 1212, HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y. Oklahoma, 310 Thompson Bldg., Tulsa, Telephone (28970). West Texas: Midland, Telephone (1982). California: Long Beach (P. O. Box 267). Wyoming: 356 N. Wolcott St., Casper. North Louisiana: Bossier City (P. O. Box 425).

Laboratory Aid—AVAILABLE TO HELP YOU FIGHT CORROSION

A major activity of the INCO Research Laboratory at Bayonne, New Jersey, is the study of corrosion.

While field tests are often to be preferred when selecting a metal for some specific purpose, laboratory tests are much better for studies of a more fundamental



Main Research Laboratories of The International Nickel Company, at Bayonne, N. J. A separate section is devoted to corrosion research.

nature such as the principles of galvanic corrosion . . . *or for extending the data obtained from field tests.*

In these roles, INCO laboratory research takes various forms.

Controlled Conditions

On some occasions, corrosion tests are carried out under controlled conditions to simulate actual service when it is not feasible to make plant tests.

In other instances, the Laboratory can be used to establish which of several factors is of *controlling* importance in a given corrosion problem. Sometimes, too, laboratory testing is needed to explain anomalies that cannot be investigated satisfactorily by further field testing, e.g., effects of impurities in process liquors.

Laboratory testing is extremely helpful after field tests have been carried to a point requiring isolation and separate study of individual factors such as aeration, temperature and velocity.

Laboratory Examination

Another phase of the Laboratory's work is the examination of materials or parts that have corroded in service. Here, trained corrosion engineers and laboratory technicians examine the specimen to determine the nature of the attack, the probable mechanism of corrosion, and the presence of any correctible causes of sub-normal corrosion resistance.

Reliable Recommendations

Such complementary testing makes possible reliable recommendations of how to minimize corrosion in service and how to select the metal or alloy best able to perform under the influence of the dominating factor (or factors) revealed.

Thus, INCO laboratory testing and INCO field testing work hand in hand in the fight against corrosion.

The two types of testing always should be considered complementary...not competitive. Very often *both* are necessary for a complete understanding of the corrosion problems brought to INCO.

One type of apparatus used at the Bayonne laboratory for control of motion, temperature and aeration in immersion corrosion tests.

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

(No. 4 in a series describing the corrosion research program of THE INTERNATIONAL NICKEL COMPANY.)

Dallas, Tex., has joined the Midland office as scout; and **Glenn W. Sandberg,** who has spent several years in geological work on the Gulf Coast and South Texas, has joined the San Antonio office as geologist.

William Holbert, formerly district superintendent at Shreveport, La., for Stanolind Oil & Gas Co., has been named to the new post of division drilling superintendent with headquarters in the division office at Oklahoma City. He will be responsible for the company's drilling program in Oklahoma, Kansas and northern Louisiana and Mississippi. **C. J. Christensen,** formerly assistant division engineer at Fort Worth, Tex., has been named to succeed Holbert as district superintendent at Shreveport. **J. L. Nichols,** formerly district superintendent at Greggton, Tex., has been named to the new post of drilling superintendent for Stanolind's North Texas-New Mexico division with headquarters at Fort Worth. Other changes within the company's North Texas-New Mexico division include: **F. A. Schell, Jr.,** formerly East Texas field superintendent, to succeed Nichols as district superintendent at Greggton; **Ralph Ludwick,** a production foreman in the East Texas area, to field superintendent; **R. G. Peeler,** production foreman at Brownfield, Tex., to assistant field superintendent of East Texas area; **L. W. Reynolds,** formerly assistant field superintendent in the East Texas operations, to field superintendent at Andrews, Tex.; **J. B. Jenkins,** formerly district engineer at Lubbock, Tex., to assistant division engineer at Fort Worth to succeed Christensen; **G. E. Crosby,** formerly field engineer for the Hendrick area at Wink, Tex., to district engineer at Lubbock; and **E. M. Knight,** petroleum engineer in the Fort Worth division office, to Hendrick field engineer.

SHIFTS—

Rae Preece, geologist, Hancock Oil Co. of California, San Pedro, Calif., to San Antonio, Tex.; **H. V. Copeland, Jr.,** geologist, Magnolia Petroleum Co., Artesia to Roswell, N. M.; **W. D. Blackmon,** geologist, Gulf Oil Corp., Azle to Kermit, Tex.; **E. Glenn Albright,** foreman, Atlantic Refining Co., Rankin, Tex., to Franklin, La.; **C. D. Cantrell, Jr.,** geologist, Phillips Petroleum Co., Midland to Houston; **C. H. Calvert,** engineer, Petroleum Service Co., San Antonio to Austin, Tex.

George E. Crosby, engineer, Stanolind Oil & Gas Co., Wink to Lubbock, Tex.; **George Belchic, Jr.,** geologist, Belgam Oil Co., Inc., Baton Rouge to Shreveport, La.; **Wilson Black,** superintendent, Humble Oil & Refining Co., Franklin to Bell City, La.; **William M. Boylan,** engineer, The Texas Co., Lockport, Ill., to New Bern, N. C.; **Prentice R. Watts, Jr.,** engineer, Stanolind Oil & Gas Co., Oklahoma City to Ellinwood, Kans.

W. L. Carr, geologist, Pure Oil Co., Billings, Mont., to Laramie, Wyo.; **W. J. Dearen,** engineer, Anderson-Pritchard Oil Corp., Oklahoma City to Great Bend, Kans.; **H. E. Armor,** foreman, Phillips Petroleum Co., Seminole, Okla., to Odessa, Tex.; **George E. Briggs, Jr.,** engineer, Stanolind Oil & Gas Co., Wewoka to Wilson, Okla.; **Ellsworth G. Skinner,** superintendent, Superior Oil Co., Shafter to Westminster, Calif.; **Jacque L. Williams,** engineer, Humble Oil & Refining Co., Fayette, to Brookhaven, Miss.

M. R. Spahr, geologist, Stanolind Oil & Gas Co., Houston to Corpus Christi, Tex.; **Roy G. Schafer,** superintendent, Rock Island Refining Corp., Zionsville to New Augusta, Ind.; **H. S. Petty,** foreman, Ohio Oil Co., Middlesboro, Ky., to Huntington, W. Va.; **Herbert G. Rim,** geologist, Geophysical Service, Inc., Bakersfield to Oildale, Calif.; **C. J. Franz,** foreman, The Texas Co., Tomball to Ganado, Tex.

A. H. Kirkpatrick, superintendent, Reno Oil Co., Electric to Wichita Falls, Tex.; **Eulan C. Kortge,** engineer, Phillips Petroleum Co., Springport, Mich., to Bartlesville, Okla.; **Mitchell Light,** geologist, The Texas Co., West Jackson, Miss., to Trenton, N. J.; **William Knesby,** engineer, Standard Oil Development Co., Rutherford, N. M., to Billings, Mont.; **Philip G. McCarney,** engineer, Texas Eastern Transmission Corp., Philadelphia, Pa., to Houston, Tex.

John E. McCall, geologist, California Co., Marietta, Okla., to New Orleans, La.; **R. J. Hixon,** superintendent, Crescent Drilling Co., Brookhaven, Miss., to Ruston, La.; **L. L. Rone,** superintendent, Kerr-McGee Oil Industries, Inc., Medicine Bow to Casper, Wyo.; **Lloyd K. Harder,** superintendent, Rocky Mountain Drilling Co., Vacaville, Calif., to Riverton, Wyo.; **J. R. Gilliland,** foreman, General Geophysical Co., Sidney to Bridgeport, Neb.; **George L. Nelson,** foreman, Magnolia Petroleum Co., Imperial, Tex., to Buckeye, N. M.

DEATHS

John C. Curtis, 72, independent oil producer and part owner of Fireside Oil Co., died recently in Eldred, N. Y.

Fred J. Rider, 86, retired oil producer of Pennsylvania, died June 19 in Bradford, Pa.

William E. Rogers, 62, Oklahoma independent oil operator, died June 23 in Tulsa. Prior to becoming an independent operator in 1917 Rogers was with Gulf Pipe Line Co.

Edgar Bogardus, assistant to the vice president in charge of sales and a specialist on prices and sales volume for Standard Oil Co. (Ind.), died June 21 in Chicago.

Dr. Francois E. Matthes, 74, a member of the United States Geological Survey for 51 years and who retired last year, died June 24 in Berkeley, Calif.

James E. Sheehan, eastern sales manager of Fiske Brothers Refining Co., Newark, N. J., died June 24 in Brooklyn, N. Y. Prior to joining Fiske Brothers in 1928, Sheehan served for 19 years with Swan-Finch Oil Corp.

Seth Bliss Hunt, 77, who retired in 1933 as vice president and treasurer of Standard Oil Co. of New Jersey, died June 22 in New York. Having served as salesman, purchasing agent and refinery plant manager, he was elected a member of the board of directors in 1914, treasurer in 1916 and vice president in 1919.

Robert A. Crawford, president of Coleman Oil & Gas Co., Dallas, Tex., died June 27 in Wichita Falls. He was formerly vice president of Lone Star Gas Corp.

Marion E. Ford, 47, a department foreman at the Houston refinery of Sinclair Refining Co., and who had been associated with the Sinclair organization since 1923, died June 23 in Pasadena, Tex.

Col. H. E. Medlicott, in charge of public relations for Anglo-Iranian Oil Co., Ltd., died last month in London. Before joining Anglo-Iranian, Medlicott had a distinguished career in the Indian Cavalry.

F. R. Campbell, 60, for 30 years with The Texas Co., first as foreman in the tank-car shop and later as industrial relations supervisor, died June 26 in Tulsa.

Warren L. Thayer, 68, Houston petroleum geologist, died June 26 in Houston. He had done geological work in Mexico, Canada, and the United States, and held properties in Esperson Dome field, Liberty County, Texas.

NORTH COWDEN

WEST TEXAS' 1st

HIGH-PRESSURE GAS INJECTION PROJECT ON COOPERATIVE AND POOL-WIDE BASIS

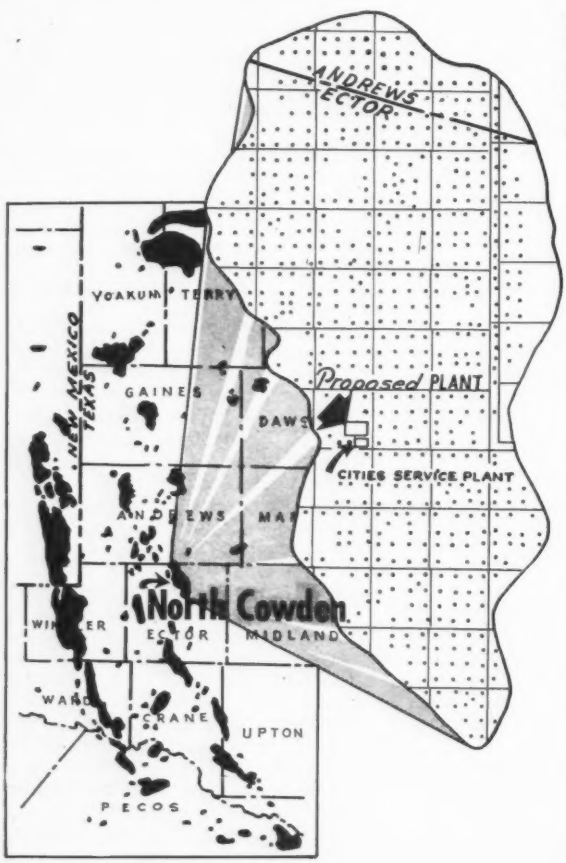
by

Kenneth B. Barnes
Engineering Editor

A 20-YEAR high-pressure gas-injection program just formulated will increase the amount of future oil to be recovered from the Grayburg lime of the North Cowden field in West Texas by an estimated 50 per cent. Principal operators in this "big pool" project, which will be virtually field-wide, are Stanolind Oil & Gas Co., The Texas Co., Sun Oil Co., Sinclair Prairie Oil Co., Atlantic Refining Co., Cities Service Oil Co., Tide Water Associated Oil Co., and D-K-M Co., along with 22* other operators having smaller interests. Approximately 80 per cent of the acreage in the field has been committed to the program, and it is expected that operators of most of the remaining acreage will ultimately join.

The over-all objectives of the North Cowden plan are increased ultimate recovery of oil and other liquid hy-

*Continental Oil Co., Kiska Oil Co., Mid-Continent Petroleum Corp., Amerada Petroleum Corp., Ohio Oil Co., Texas Gulf Producing Co., Edson Petroleum Co., Phillips Petroleum Co., Magnolia Petroleum Co., Edward E. Reigle, Trustee, Aline C. Delaney, Skelly Oil Co., Acme Oil & Royalty Co., Iva C. Richmond, Mrs. Irene D. Kervin, Mrs. Mary D. McBee, Mrs. Loretta D. Lancaster, Miss Ann D. Guthrie, Mr. C. W. Murchison, Trustee, Mrs. Ocie Virginia McDonald, Mrs. Janice Florine Whitted, Sunray Oil Corp.



Map of the 12 by 6-mile North Cowden pool "exploded" into detail from its position in center of huge West Texas-New Mexico producing area

When 30 operators—ranging from major companies to independent producers—can plan, develop and execute a cooperative pressure maintenance or gas injection program for an important 27,000-acre major field in less than 2 years' time—that is a petroleum engineering effort and conservation accomplishment of the first order. Moreover, when the locale happens to be a "typical" pool in the very center of the Permian lime production area of West Texas-New Mexico, with average permeability of 3 millidarcys and porosity of 10.2 per cent—the forthcoming project assumes special significance as an initial "yardstick" towards similar work in other fields in this vast producing territory.

The new North Cowden project, cooperative in nature, was accomplished probably more speedily than any other such program heretofore. The framework is basically simple in nature, there being agreements between the participants as to, (1) the producing features, (2) the gasoline-pressure plant operations, (3) the gas injection work, (4) the casinghead gas contracts, and the consolidation of various leases to within "injection blocks" of approximately 640 acres for uniformity of repressuring coverage. Much credit for the formulation of the program is due Whitney M. Elias, superintendent of Stanolind Oil & Gas Co.'s unitization department, and Donald B. Edwards, Stanolind's chief gas engineer.

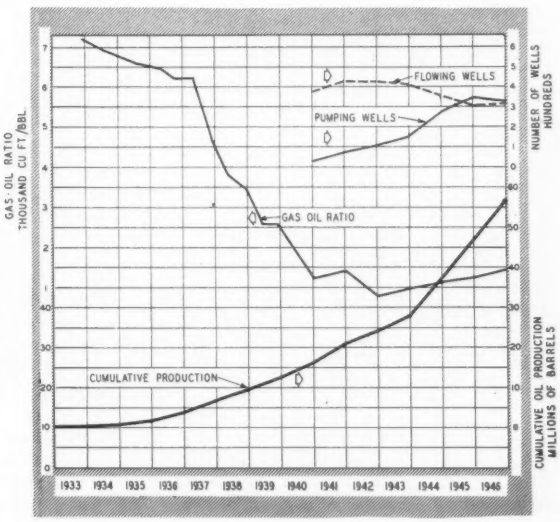
Nucleus of the 27,000-acre gas-injection program will be this Cities Service plant, to be taken over and expanded into a L.P.G.-natural gasoline-pressure plant unit. This aerial photo was "flown" last week, concurrent with final acceptance of the program among operators

drocarbons, and maximum utilization of reservoir gas energy. Engineers of the operators participating in this huge new gas-injection project—which will be one of the country's largest—estimate that the increase in the future oil to be recovered will be about 50 per cent, and that the field will produce 8 years longer with gas injection.

The North Cowden development is in conformance with conservation principles which have been strongly advocated by the Railroad Commission of Texas. In the West Pampa field of the Texas Panhandle, the pool-wide gas-repressuring project which started there in March 1946, is showing substantial benefits. There also has been gas injection work in West Texas (Cedar Lake, McElroy, and elsewhere), but the forthcoming North Cowden program will eclipse these very considerably on several counts. These include more productive acreage, higher injection pressure, a larger combination gasoline-pressure plant, etc. As a matter of fact, the new North Cowden project will constitute one of the most significant developments in petroleum production and engineering work in the vast Permian Basin country since the first oil was obtained there.

The North Cowden field is located pretty much right in the "middle" of the whole West Texas-New Mexico producing area, about 27 miles northwest of Midland, Tex. There are literally hundreds of other limestone fields in the West Texas-New Mexico area in which similar installations might be made, and thus successful operation at North Cowden should lead the way toward similar conservation projects in that territory. Moreover, the care, detail, and engineering studies with which the North Cowden plan was put together will serve as a model in many respects for this kind of development, not only in the Permian Basin but elsewhere.

When "planning the project" started two years ago, all basic production (see chart) and reservoir data were assembled, studied, interpreted. Operators-engineers meetings were held, information supplied to royalty owners, plant needs and redesigns detailed, etc.



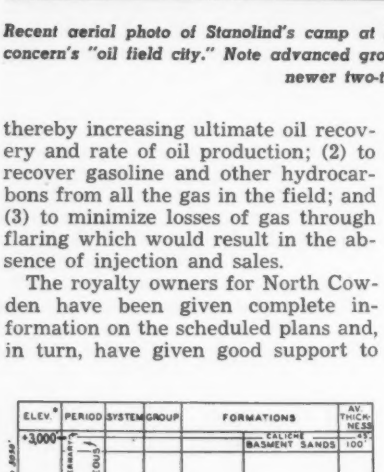
Over-All Objectives

The new producing program, in brief, contemplates collecting the casinghead gas produced with the oil, processing it through a gasoline plant to remove liquefiable hydrocarbons, repressuring the remaining residue gas, and injecting a majority to possibly all of it into the Grayburg producing formation. Residue gas not required for injection will be sold. Purpose of the program is: (1) to control the pressure decline in the reservoir,

Recent aerial photo of Stanolind's camp at North Cowden. This picture gives an interesting visual presentation of the expansion of this concern's "oil field city." Note advanced growth of the shade trees among the one-third of the houses in right foreground—compared to newer two-thirds of camp and trees there which are just getting started

thereby increasing ultimate oil recovery and rate of oil production; (2) to recover gasoline and other hydrocarbons from all the gas in the field; and (3) to minimize losses of gas through flaring which would result in the absence of injection and sales.

The royalty owners for North Cowden have been given complete information on the scheduled plans and, in turn, have given good support to the program. Obviously, the accomplishments of the objectives will increase revenues to all parties owning oil and gas rights at North Cowden. As a matter of fact, while the oil operators are spending more money to recover more of the oil—the royalty owners benefit on an even greater scale because they get greater amounts without any additional costs—as all of the expense of the program will be carried by the participating operators. The royalty owners are expected to realize more than half again as much income during the next 20 years.



North Cowden—Generalized geologic section

Geology of North Cowden

Production is obtained primarily from the Grayburg formation of Permian age. The pay section can be divided roughly into four producing zones separated by barren dolomitic sections (see accompanying chart). The productive zones vary in composition. from predominantly limy sand in the first zone to dense dolomite in the fourth zone. The structure is anticlinal with its axis running northwest-southeast. Maximum relief between crest of the structure and the downdip limits of production is about 800 ft. Structural conditions, together with degree of porosity and permeability development, are the factors which determine the productive limits.

Characteristics of the Reservoir

The reservoir-pressure decline and water-production history clearly indicate that the field is performing under the gas-expansion type of reservoir control. Average gas-oil ratio initially was around 7,000 cu. ft. per bbl. due to the earlier development in the gas-cap area and the production of gas-cap gas. Although the gas-oil ratio was effectively reduced by remedial work, reaching a minimum of 800 cu. ft. per bbl. in February 1943, later the gas-oil ratio increased steadily. Average was 1,750 cu. ft. per bbl. in January 1948.

Bottom-hole oil-sample analysis and past pressure-production history indicate: (1) that the reservoir crude was initially saturated with 562 cu. ft. of solution gas per barrel at the original mid-point reservoir pressure of approximately 1,800 psi. in the vicinity of the gas cap, and (2) that the oil on the down-structure eastern flank of the field was initially undersaturated. It is estimated from data available that the equilibrium reservoir pressure as of February 1948 had declined to approximately 980 psi.

Crest of the structure along the west side of the field is occupied by a gas cap originally extending over approximately 7,900 acres. From detailed studies of more than 200 well logs, gas-oil ratio data, and numerous temperature surveys, the gas-oil contact is estimated at from minus 900 to minus 1,020 ft., subsea.

Careful studies of the character of the producing zones were made from core data obtained from 27 wells distributed fairly well throughout the field. The over-all or gross producing interval, however, as mentioned previously, is divided into four producing zones separated by barren, dolomitic sections, and the actual or net effective pay is very substantially less than the gross over-all pay. The net effective pay varies in character and thickness in different parts of the field but the changes are rather well defined from the numerous core tests made. From the data obtained from the core analyses, an average permeability of 3 md. and an average poros-

ity of 10.2 per cent have been determined for the effective pay. Average connate water content is estimated to be 15 per cent.

Predicted Reservoir Performance

Estimate of future gas-oil ratio and equilibrium reservoir pressure trends under primary operations and with the gas-injection program are shown in the accompanying graphs. These estimates were based on the premise that the average daily production for the field would be maintained at 26,000 bbl. per day until the wells are incapable of producing this amount, at which time the oil production would decline. Material balance methods and actual performance of comparable reservoirs were used for extrapolating future gas-oil ratio and reservoir pressure trends.

Gas-Injection Operations

It is estimated that approximately 75 input wells fairly uniformly distributed throughout the field will be required. This is an average input to producing well ratio of one to seven (about one input well per 320 acres).

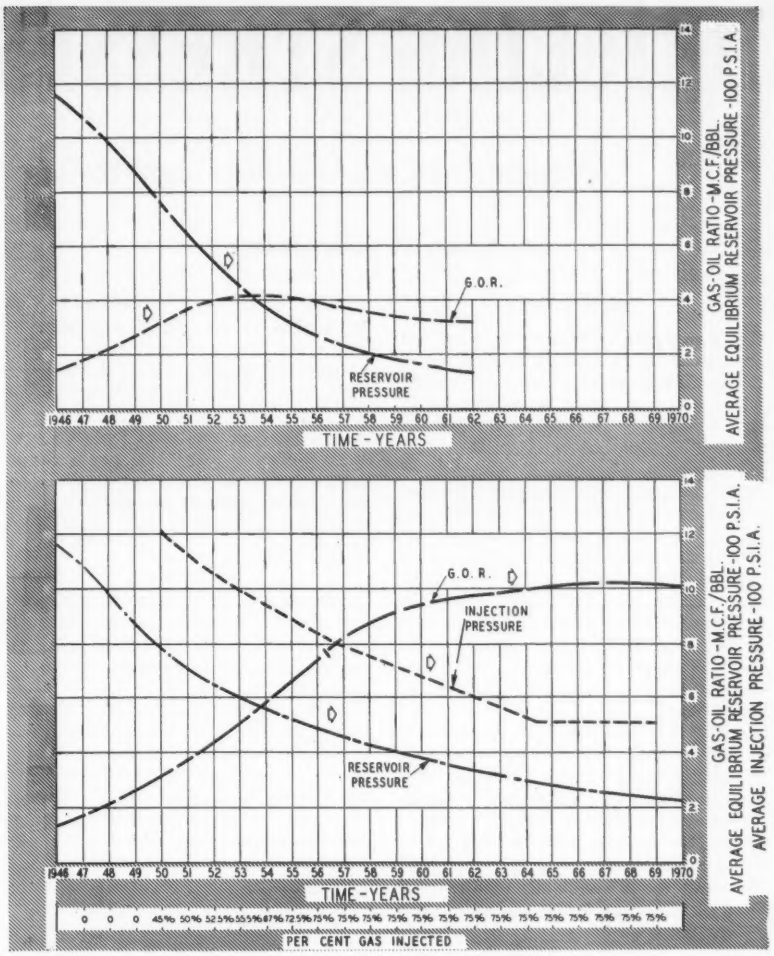
The plan is for an intensified type of injection operation, whereby initially 45 per cent of the produced gas would be injected—and the injection rate increased gradually as conditions warrant over a period of approximately 5 years. At that time in the neighborhood of 75 per cent of produced gas would be returned to the reservoir.

The injection program contemplates an initial gas-injection rate of about 30,000,000 cu. ft. per day or 400 M.c.f. per injection well per day (average), which rate would be gradually increased to a maximum of about 80,000,000 cu. ft. per day within 5 years. During this period if all of the available residue gas is not required for return to the formation, the remaining gas will be available for sale.

New Plant and Gas Systems

The North Cowden field has been served for 12 years by a gasoline plant of Cities Service Oil Co., and Cities Service has made an outstanding contribution to the program by agreeing to share ownership in the plant with the other operators. This plant, which operates as an absorption plant at 60 psi., is connected to 90 per cent of the North Cowden wells. The presently installed plant and its accompanying gas-gathering facilities form an important nucleus for the large-scale operation that lies ahead. And, the operators who elected to participate in plant ownership have arranged: (1) to purchase the Cities Service gasoline plant; (2) to enlarge the plant to permit processing all gas produced in the field; (3) to install additional compression equipment at the plant; and (4) to lay high-pressure gas lines through-

(Continued on page 119)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RESERVOIR PRESSURE
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TIME-YEARS
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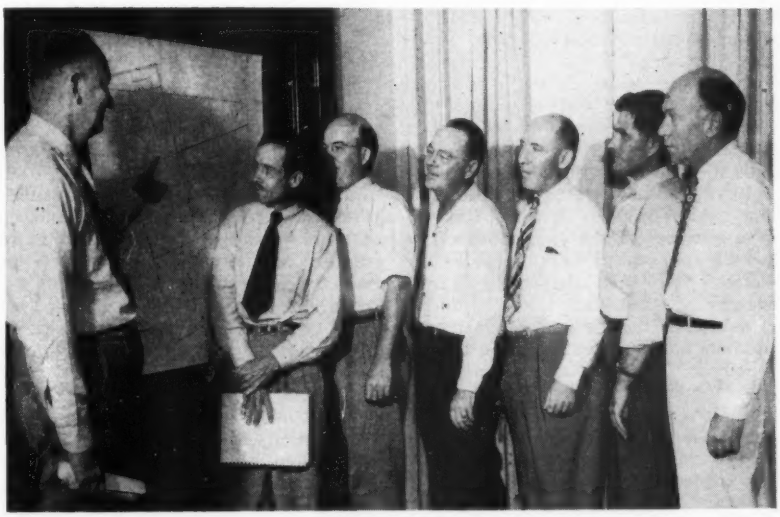
G.O.R.
INJECTION PRESSURE
RESERVOIR PRESSURE
TIME-YEARS
PER CENT GAS INJECTED
AVERAGE INJECTION PRESSURE-100 P.S.I.A.

Future performance for North Cowden under "ordinary" production method is shown in top chart, by gas injection in bottom chart. Present oil rate is 26,000 bbl. per day. New program is not expected to increase this, but will hold rate higher, carry producing life longer. Computations were made from material balance studies of reservoir



R. W. Johnston, Cities Service, points out location of present North Cowden gasoline plant to E. E. Reigle, trustee; W. N. Little, Tide Water; D. E. Kervin, D-K-M; G. H. Card, Stanolind; Edward Pierce, Mid-Continent; and J. E. Regent, Sun, representatives of some of the operators in the field

DRILLING STRESSES

Present in cable-tool operations

by John F. Kendrick*

Introduction

THE weights of the cable itself and the tools cause the drilling cable to untwist, due to its helical structure, when it is run into a bore hole. When the tension is reduced on an untwisted drilling cable, it kinks or dog-legs readily.

There is a wide range in the tension in a drilling cable between the up and down strokes. Experience in intermediate-depth drilling has demonstrated that when a Prosser swivel rope socket is used, little can happen to a drilling cable, except normal wear, provided the swiveling element is kept in working condition and provided too high or tight a hitch is not used.

It is the function of the swivel socket to keep the drilling cable retwisted, but the swivel socket will not function fully unless it is possible to run with enough motion to throw the weight off the clamp for an instant at the beginning of the down stroke. This condition is indicated by the split second when the driller can take up screw. At present it is not possible to run with enough motion in deep drilling to enable the swivel to function fully. Under these conditions, the drilling cable is partially untwisted all of the time. The amount of untwisting is not uniform throughout the length of the cable, being a maximum directly under the clamp and zero at some point above the rope socket.

In deep drilling, the cable is elastic and will vibrate with a natural frequency which depends on its physical properties. Depending on the depth, half the wave length of this vibration is a fraction of the length of the drilling cable. In deep drilling, this appears to be in the neighborhood of 0.8 of the length of the cable. but varies with the size of cable and weight of tools, etc.

As the natural vibration is generated each cycle, it reduces the tension locally in the cable, at some point below the clamp, while maintaining enough tension on the swivel to prevent it from functioning. This causes a localized working of the strands of the cable, as in the early stages of kinking, or dog-legging, as the reduction in tension occurs where the cable is partially untwisted. This results in the permanent elongation or "pulling out" of the lay of the cable, and as the cable is inched into the hole while drilling progresses, the cable fails over an ever-increasing portion of its length.

*Consulting engineer, 16 East Broad Street, Columbus 15, Ohio.

SOME data were presented by the author in an earlier article under the same title, on the drilling stresses caused by the traveling wave or vibration in cable-tool operations. (The Oil and Gas Journal, December 13, 1947). This article, part 2 of the problem, now considers the stress caused by the natural vibration of the drilling cable associated with an untwisted condition in the cable below the clamp.

This situation is alleviated by anything that will lessen the degree of untwisting in the upper part of the cable. A swivel socket should be used in combination with the longest practical surface stroke. Tapered drilling cables are necessary and preforming helps as the depth increases. The definite solution of the problem appears to depend on learning to drill at great depth with sufficient motion to keep the cable fully retwisted. This offers the added possibility of increased drilling speeds, due to the increased impacts per minute. (The problems incident thereto will be discussed in a subsequent article).

Some Characteristics of Wire Rope

Present-day steel drilling cable generally consists of what may be thought of as six open-coil helical springs assembled adjacently on a common core. When new, the drilling line has a known lay, a known area of metal, a known weight per foot, a known diameter and a known modulus of elasticity. These factors change as the cable ages, and more should be known about the rates at which the changes take place.

For instance, a driller is apt to complain that a new drilling cable is too "springy" and that an old line is too "stiff." In drilling, the lay is gradually elongated permanently or "pulled out," increasing the modulus of elasticity, but nothing is known at present about the rate at which these changes take place or the effect drilling with too tight or high a hitch has on the rate of change.

The helical structure of the drilling cable causes it to untwist when it is subjected to a pull or tension and one end of it is free to turn. The pull or tension is the result of three forces: (1) weight of the cable, (2) weight of the tools, and (3) inertia of the cable and tools during the last half of the down stroke.

As the drilling line untwists, it elongates. A few years ago, American Steel & Wire Co.[2] extrapolated from some pulling-machine tests and found that a 2,000-ft. line will elongate about 74 in. under a static load of 3,000 lb. as a result of untwisting alone. A drilling cable, even a new one, is therefore well untwisted by the time the string of tools reaches the bottom of the hole.

It is a matter of common experience that an untwisted drilling cable will kink or dog-leg whenever the tension is removed. This is demonstrated whenever it is necessary to remove an old line from the bull wheel. It is also the reason the tool dresser puts a wrench on the cable and retwists it as much as he can easily, before the driller hitches on. This is particularly necessary whenever a straight rope socket is used. The operation of the swivel rope socket enables the drilling cable to retwist each cycle, at least partially, thereby shortening the cable. The The driller then says the swivel has "taken up."

The Straight or Stiff Rope Socket

While the straight or stiff rope socket is largely obsolete, it is still used in some areas in preference to the swivel socket, and is frequently used everywhere briefly for special operations. As is well understood, there is no relative motion possible between the wire rope and the string of tools when a straight socket is used, as the end at the drilling cable is babbitted into the tapered socket, which is integral with the rope socket itself.

There is of course a very material difference in the tension in the drilling cable during the up stroke of a cycle when it is a maximum, and the down stroke when the tension is a minimum. As the drilling cable is thoroughly untwisted whenever a straight rope socket is used, the drilling cable will kink or dog-leg during the last half of the up stroke of the cycle—unless the driller uses a slow enough drilling motion to permit the torque in the untwisted line to get the tools turning in the opposite direction and enable the cable to retwist without dog-legging.

The torque in the untwisted cable was actually measured during the experiments on which these articles are based. While the magnitude of the torque was greater than anticipated, it is not very great when one considers the torsional inertia in a string of tools. The driller therefore has to use a relatively slow drilling motion when using a straight rope socket.

If the strokes per minute established by custom are exceeded ma-

terially, the drilling cable will dog-leg. The writer believes that this is the experience drillers refer to when they say "you 'catch' your tools when you speed the cable-tool drill up."

During the experiments, the rig was operated up to 60 s.p.m., and nothing was observed that remotely resembled "catching" the tools. However, a swivel rope socket was used throughout the experimental work, and it is evident that when a swivel socket is used, one can do things with the cable-tool drill relatively safely that would be disastrous with a straight rope socket.

Swivel Rope Socket

Relative movement is possible between the lower end of the drilling line and the string of tools when a swivel socket is used, as the end of the cable is babbitted in the tapered socket which is incorporated in a swiveling element or "stinger." This is provided with a shoulder which bears against a mating shoulder in the rope socket housing and which is generally joined to the drilling jar, so that the swiveling element can turn about the vertical axis.

While a number of patents were granted between 1903 and 1914 on antifriction bearing racheted-type rope sockets, none proved practical enough to survive to this day. The high peripheral velocities when the swivel functions and the requirements of jarring have established the plain shouldered thrust bearing of the Prosser swivel rope socket as standard. Space limitations restrict the dimensions, causing high contact pressures, so the swivel functions most completely during the first part of the down stroke.

The useful function performed by the swiveling element is to enable the untwisted drilling cable to retwist. An untwisted cable will kink or dog-leg easily. Then the duty on the cable during drilling is not unlike flexing a piece of bailing wire, and failure is rapid. However, little harm can be done to a fully retwisted and relaxed drilling cable, operated within sensible limits.

In deep drilling one important requirement in the operation of the swivel socket is frequently overlooked because it is not a factor in shallow and intermediate-depth drilling. To enable the swivel to function fully, it must be operated at a speed or with sufficient drilling motion to throw the weight of the cable and tools off of the temper screw for an instant, during each cycle. This is indicated by the split second which occurs at the beginning of the down stroke when the driller can "take up screw." Whenever a swivel in good condition is operated at a speed which permits the driller to take up screw easily, one may feel sure that the drilling cable is fully protected against kinking or dog-legging. Under these conditions the line is fully retwisted and relaxed at the beginning of each down stroke.

During the latter part of the down stroke the drilling cable will be untwisted not more than three or four turns, as may be deduced from the scratches on the string of tools. This is not enough to endanger the drilling cable except possibly in very shallow drilling, and the slight untwist is removed at the beginning of each down stroke, restoring the cable to its fully retwisted condition.

Thus, we see that one must use a slow drilling motion to protect the cable against kinking or dog-legging when a straight rope socket is used, while one must use a motion above a critical velocity to protect the cable against kinking or dog-legging when a swivel socket is used. This is the reason a driller can "make more hole" or drill faster with a swivel socket than with a straight rope socket.

During the 1940 spring meeting of the Eastern District, American Petroleum Institute, at Columbus, J. A. Fox read a paper[3] which contained the following:

"We have found that this procedure demands the use of swivel sockets instead of straight, or stiff sockets, for maintenance of proper reaction of the tools during drilling. Among other advantages, the use of swivel sockets in the drilling of these deep wells has enabled us to keep holes straighter, has reduced friction against the wall of the hole and consequent line abrasion and line cutting of casing, and has speeded up drilling time. At first, we had a little difficulty in training our drillers in the use of swivel sockets, but now that the drillers are accustomed to their use, I believe we would encounter much more dissatisfaction if we discontinued their use than we did when we adopted them. We have found it very difficult to run swivel sockets at depths greater than 5,000 ft. with the wrist pin in the second hole on the crank. By running with the wrist pin in the third hole, however, we have been able to drill without trouble or inconvenience to depths as great as 8,159 ft."

The writer's interpretation of Fox's experience, in the terms of this analysis, can be stated in a few words. The average temper screw velocity is equal to twice the length of the stroke in feet times the strokes per minute. At depths below 5,000 ft. the maximum strokes per minute is small because the point of vibrational resonance occurs at a low velocity. Therefore, to drill above the temper screw velocity that will enable the swivel socket to function to protect fully the drilling cable, the length of the temper screw stroke has to be increased. The length of the temper screw stroke should be increased as the strokes per minute are reduced on deeper drilling to make this expedient fully effective at greater depths, which is generally impractical.

The method used by many drillers in making a hitch when running a swivel rope socket is to set the tools on bottom and slack off. This enables the drilling cable to retwist the amount it was untwisted due to the weight of the tools but it leaves the amount the line has untwisted, due to its own weight, still in the drilling line.

It will be realized that the cable is completely retwisted directly above the rope socket, which is fortunate, as this is why it is difficult if not impossible to "knock off" a drilling line directly above the rope socket, when a swivel rope socket is used. The drilling cable under these conditions becomes progressively untwisted above the rope socket, with the untwisted condition reaching a maximum directly under the clamp at the surface of the hole.

When using this technique, the driller marks the point on the cable where he feels the drilling jars close, and hitches on, with the beam at the end of the down stroke. Very shortly after he starts his drilling motion he gets the signal that he is drilling very "tight." This is due to the shortening of the drilling cable, as the temper screw velocity has caused the swivel socket to function, permitting the cable to retwist.

The driller then slips the line through the clamp if the hole is shallow enough, or lets out screw until he gets a satisfactorily loose or low hitch. In deep drilling where it is impossible to slip the line through the clamp, too great a percentage of the temper screw travel is lost in simply making the hitch. The writer's opinion is that it will be possible to predetermine the amount of slack that can be left in the drilling line safely, when a swivel socket is used, and eliminate largely this loss in temper screw feed when making the hitch.

A Problem in Vibrational Mechanics

Intermediate and deep cable-tool drilling are distinctly problems in vibrational mechanics. A vibration is commonly understood to mean the movement described by a point until the motion begins to repeat itself. Thus, the drilling motion of the beam is a vibration that generally approximates simple harmonic motion. One cycle is the motion of the temper screw from the beginning of the down stroke to the end of the up stroke, whereupon the cycle is repeated.

As mentioned before, the drilling cable generally consists of a number of open-coil helical springs assembled adjacently on a common core, and it is elastic at the depths we are considering. The primary effect of the drilling motion is to generate a longitudinal wave in the drilling cable, although there may be a transverse component due to the sidewise motion of the clamp, especially when the longer strokes are used. Such a sidewise component seems to be important only to the degree it increases the wear on the cable. The length of this longitudinal wave is approximately twice the length of the drilling cable although there are no doubt overtones to confuse the investigator.

Whenever an elastic body is excited it will vibrate in a manner that depends on its physical properties only. Thus a simple pendulum will oscillate or vibrate in a manner that depends only on its length. This is the natural vibration of the system.

The reader can get a concept of it if he will link together a sufficient number of rubber bands to make an elastic chain. Any convenient weight, such as a nut, should be attached to the lower end of the elastic chain. The upper end of the elastic chain should be attached to any convienient support. Then the weight should be pulled downward several inches and released. It will be noted that the weight will bounce up and down several times before being brought to rest by frictional forces.

The length of the wave of the natural vibration is less than the wave generated by the drilling motion. In relatively shallow drilling the wave length of the natural vibration is but a fraction of the drilling-motion wave length, while in very deep drilling the wave length of the natural vibration is very nearly equal to the drilling-motion wave length. These two vibrations are responsible for most of the phenomena of intermediate and deep cable-tool drilling. The more economical utilization of these phenomena has been the objective of the study on which these articles is based.

Natural Vibration Causes "Jiggle" Signal

It is the natural vibration that causes the jiggle in the drilling line or clamp that drillers use to determine the rate of temper screw feed, when a spliced drilling cable is used and there is no noise. In our experiment with the weight on the chain of rubber bands, we can simulate the effects of a high or tight hitch by the distance we pull the weight downward before releasing it.

The greater the distance the weight is pulled down before it is released, the tighter is the "hitch," as the tools have to "reach out" farther to strike the bottom of the hole. It will be noticed that the tighter the hitch, the greater is the reaction in the "drilling cable" or chain of rubber bands. As the hitch is loosened up, the jiggle becomes less pronounced, and this is one of the indications the driller relies upon in regulating his rate of feed.

The noise or traveling wave signal, discussed in the previous article[1] cannot be present unless the tools strike the bottom of the hole, but the jiggle will be observable, even in a completely "drilled off" condition. In Michigan last summer, a friend told the writer of going through all the motions of drilling a screw and ending up with no measurable amount of new hole. The writer did not laugh, as we had the very same experience, not once but several times, during the experimental work.

The effect of the natural vibration of the drilling cable is to reduce the tension locally at some point in the drilling cable below the clamp. It is difficult to find a common illustration that will help to fix this important concept in the reader's mind. Once in a while, a train crew will shunt a loaded car into a string of cars on a siding, the last one of which is not coupled to the string. In such cases, the main string of cars will not move appreciably, but the last, the unattached car, may move several feet on down the track. The writer once inspected the damage caused by an explosion in a compressed-air distribution line. At regular intervals, a joint of pipe was split and laid out flat, while the pipe in between appeared undamaged. This concept of the natural vibration reducing the tension locally in the cable at some point below the clamp, while maintaining enough tension on the swivel to prevent it from functioning, is very important. It is hoped that the reader can visualize it one way or another.

Attention has been called to the fact that the wave length of the natural vibration depends only on the physical properties of the elastic structure and it is, therefore, a constant at any given depth. If a slow drilling motion is used, the jiggle will occur during the first part of the up stroke of the beam. As the drilling motion is increased, the jiggle occurs higher and higher on the up stroke, until it may occur very close to the end of the up stroke. Should the drilling motion be increased further, the jiggle will disappear entirely. This has given rise to the belief that the tools are no longer moving.

While each case will have to be analyzed individually, the available information indicates that in the majority of instances the tools continue to have plenty of motion, only the signal has disappeared for the reasons stated. It should be noted that the point of the jiggle is fixed, for a given set of conditions, and that the stroke of the beam moves with respect to this fixed point, rather than the reverse.

Stress Cause by Natural Vibration

It has been pointed out that it is difficult to damage a drilling cable that is completely retwisted and relaxed by the swivel socket, after being untwisted by its weight and the weight of the tools, when being run into the hole. This is one of the factors that make the drilling-cable performance satisfactory on shallow and intermediate depth drilling, when it is possible to run with enough motion to enable the swivel to function properly.

It will be appreciated that the lines of demarcation between shallow, intermediate, and deep drilling are not sharp, but towards the end of the intermediate depth zone we reach a point where it is no longer possible to drill with enough motion to enable the swivel to function properly. In the section of this article on the swivel rope socket, attention was called to the fact that some contractors and drillers successfully meet this condition, for a time at least, by increasing the length of the surface stroke, thereby enabling the swivel to function effectively to a greater depth.

Eventually, a depth is reached when all such expedients fail. We are then confronted by a condition where the drilling cable becomes progressively more and more untwisted directly below the clamp, and the degree of untwisting decreases to zero at some point above the rope socket. The natural vibration of the drilling cable, locally reducing the tension at some point in this zone of untwisted drilling cable, enables the strands to work, as in the early stages of kinking or dog-legging.

This action must be very slight, otherwise the drilling cable would last only a matter of hours instead of days. Also, the length of drilling cable affected must be relatively short, but the failure is progressive, as the line is inched into the hole so that the part of the line first affected is relieved of further strain, for otherwise the cable would last a few hours only.

Thus, we see the trouble is caused by a local reduction in tension, some distance below the clamp, associated with an untwisted condition in the drilling cable rather than by a peak in the tension occurring some distance below the clamp. The distinction is important, as there is a chance that we may be able to keep the cable fully retwisted and relaxed, from the clamp to the tools, and thus reduce the cost of the drilling cable per foot of hole materially.

Field Experience

A couple of cable-tool operators have been thoughtful enough to describe in the literature field experiences that seem to support this analysis, at least partially.

Fox[3] writes:

"The depth of the hole at the time was 6,000 ft., its diameter 8 in., and the objective was the Clinton sand which was expected at approximately 6,500 ft. We had installed a new 7,500-ft. 1-in., 6 by 21, improved plow-steel line and had it for about 6 days using a stiff socket and with the wrist pin in the second hole. At the end of this time we discovered that the "lay" (or "twist") had been "pulled out" or extended) from 6 in. per 6-coil twist, when new, to 12 in. per 6-coil twist at a point approximately 300 to 500 ft. below the wire-line clamps. The wire-line manufacturers told us this was the structural limit of the line; that any greater "lay" extension probably would result in a broken core which would mark the end of the useful life of the line for drilling."

Galey[4] writes:

"The major stress on the line, when drilling at great depths, appears to be at

from 800 to 1,000 ft. below the surface. For this reason, while drilling the deeper portion of the hole (drilling was discontinued at 10,096 ft.) the lay in the line was carefully watched and measured daily. When the lay was found to exceed 11½ in. at this depth, the line was no longer considered safe to run. On the 12,000-ft. 1-in. line put on at 8,825 ft., the lay increased from 9 in. at 8,848 ft. to 11¼ in. at 9,594 ft. When the 4,000 ft. of ⅞-in. line was spliced on this, the lay was only 9¼ in. at 9,657 ft. The lay remained practically the same until the tools were stuck at 9,704 ft. After the line had been cut at the latter point, the tools drilled by and a depth of 9,815 ft. reached, the lay was 11 in."

Experimental Data

The only dynamometer cards of deep cable-tool drilling operations that are readily available were taken by Gulf Research & Development Co.[5] One of these is reproduced as Fig. 1. This was taken with a Kemler well weigher at a depth of 6,722 ft. A 19.29 32-in. strokes per minute. A spliced cable was used, the lower section being 4,000 ft. of 1-in. hemp center and the upper section being 2,722 ft. of 1-in.. independent wire center. The string of tools was computed to weigh 3,000 lb., and the wire line in the hole was computed to weigh 10,-670 lb. The normal hitch was made with the beam in the down position and the bit 8 ft. (static) above formation. A straight or stiff rope socket is reported to have been used, when the dynamometer cards were made. These cards reflect conditions that are no longer regular practice. A swivel rope socket and a hitch that amounts to picking the tools up and setting them down again are most commonly used at these depths now.

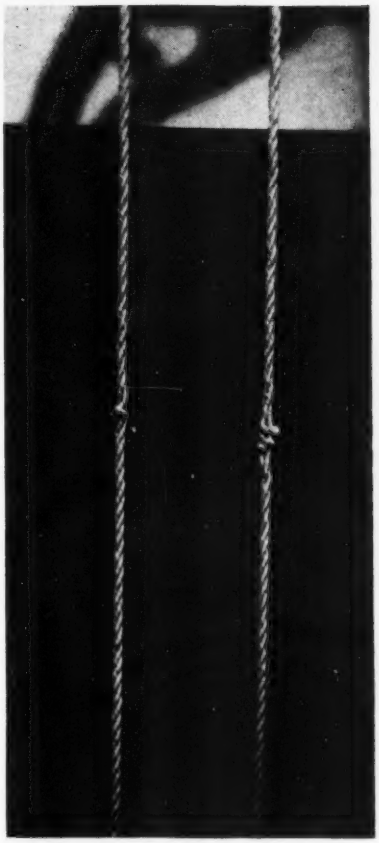


Fig. 6—Kinks or doglegs in untwisted stranded cotton cord, illustrative of extreme action in a steel cable-tool drilling line

Analysis of Dynamometer Card

Referring to Fig. 1, the case for the bit striking at 1 was stated in the previous article[1] and from the conditions outlined above, it is evident that the drilling cable was in a thoroughly untwisted condition, when the bit struck. The operation of the natural vibration to cause the line to dog-leg or kink at positions 3 to 4 will be discussed shortly. Part of the dog-leg was pulled out at positions 4 to 5 and the remainder was pulling out at positions 7 to 8. While the experimental data are too meager to write about with finality, it is anticipated that a dynamometer card taken of current practices, under similar conditions, would show much the same but less-pronounced characteristics. Of course, no drilling cable will stand up for long, under the extreme conditions shown in Fig. 1, and the drilling-cable record of the well from which the card was obtained is reported to have been extreme.

The up-stroke line of the dynamometer card of Fig. 1 is subjected to a simple analysis in Figs. 2 to 7 inclusive. The tension in the drilling cable, during the up stroke, is the result of two vibrations acting concurrently. First of these is the drilling motion, shown in Fig. 2, the friction component, proportional to the first power of the velocity, being represented by A and the inertia component, proportional to the acceleration, by B. These have been plotted on the scale of Fig. 3 and those directly above the figure, which are projections on a diameter of points uniformly spaced on the semicircle.

The second vibration is the natural vibration of the drilling cable, shown in Fig. 4, the friction component, proportional to the first power of the velocity of the natural vibration, being represented by C and the inertia component, proportional to the acceleration of the natural vibration, by D. The relative magnitudes of these tensions have been set up on a purely arbitrary basis, as they are added together to get the final concept. Fig. 4 has been plotted from the scale of Fig. 7 and those directly above the figure, which are projections on a diameter of points uniformly spaced on

(Continued on page 70)

Fig. 1—Dynamometer card showing variation in the stresses in a spliced steel drilling cable at various points on a cycle, taken at a depth of 6,722 ft. Fig. 2—Stresses caused by the drilling motion. "A" is the friction stress proportional to the first power of the velocity. "B" is the inertia stress proportional to the acceleration. Fig. 4—Stresses caused by the natural vibration of the drilling cable. "C" is the friction stress proportional to the first power of the velocity of the natural vibration. "D" is the inertia stress proportional to the acceleration of the natural vibration. Fig. 5—Composite stresses in the drilling cable during the upstroke. "E" is the algebraic sum of curves of twice the magnitude of "A" and "B" of Fig. 2, on the assumption that only the drilling motion is present. "F" is the algebraic sum of curves A and B (Fig. 2) and C and D (Fig. 4), assuming that both the drilling motion and natural vibration are operative

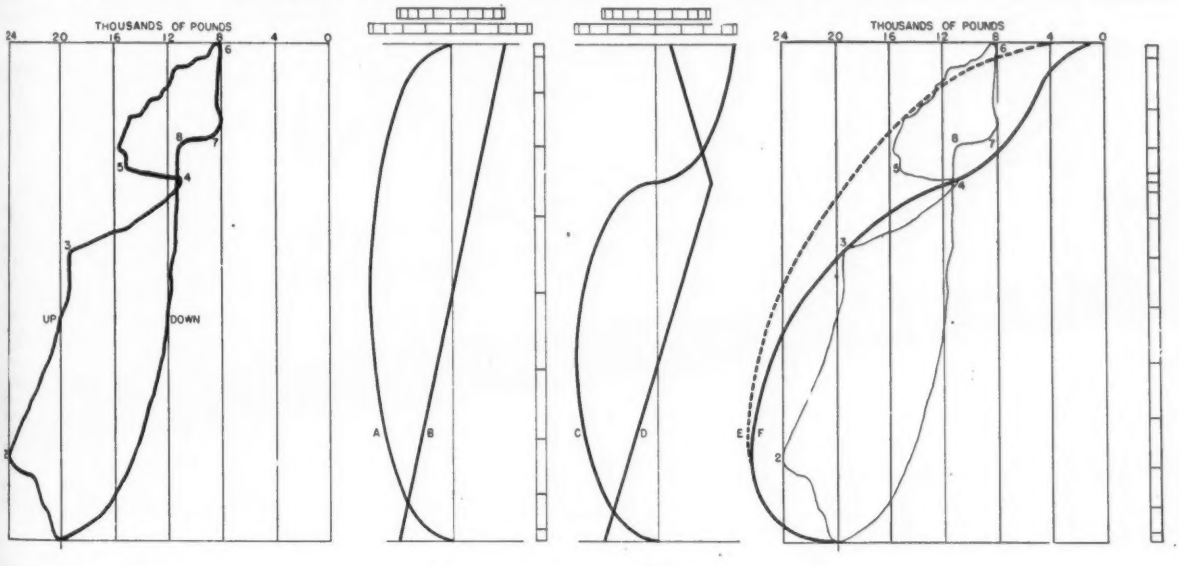


FIG. 1 FIG. 2 FIG. 3 FIG. 4 FIG. 5 FIG. 7

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Performance Chart

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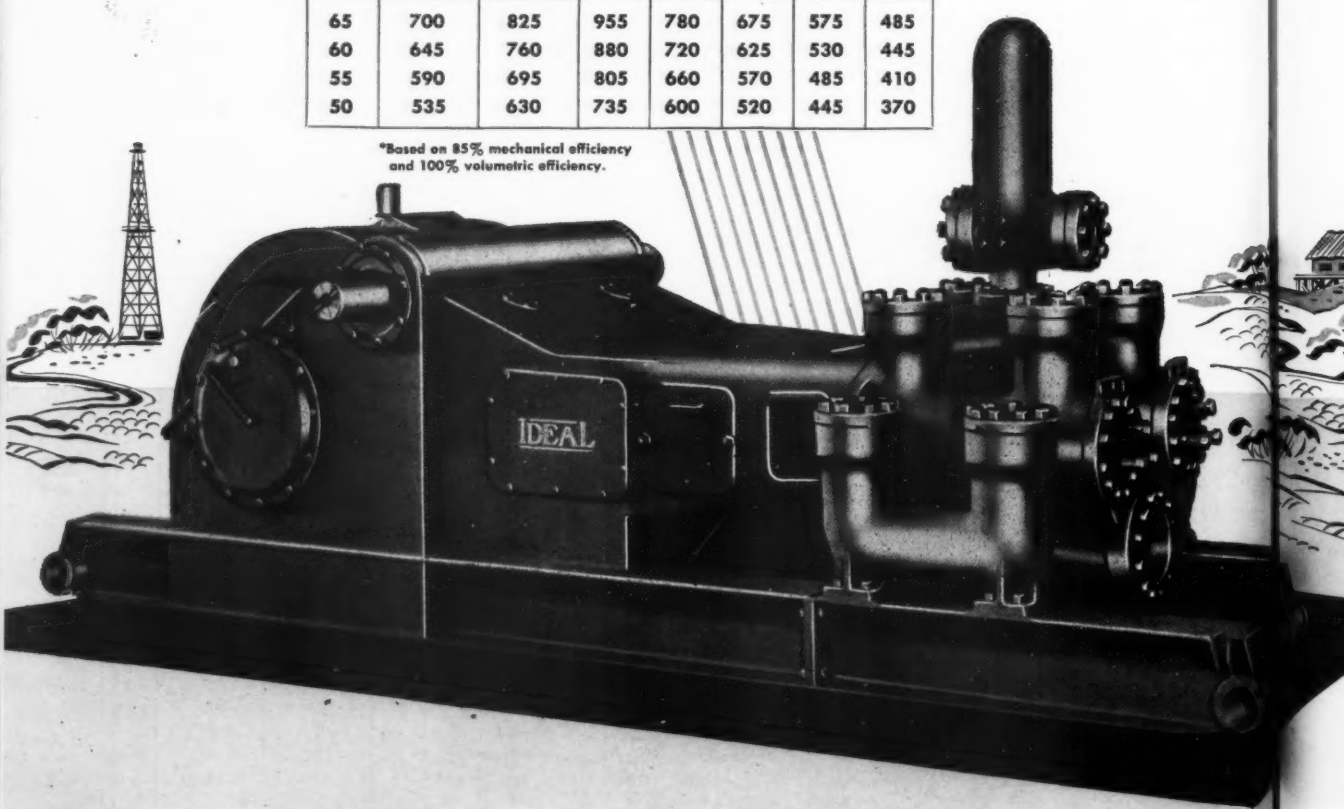
Volume Per Stroke, Cubic Inches . . .	3385	2775	2400	2045	1720
Volume Per Stroke, Gallons	14.66	12	10.4	8.85	7.44

Pump Speed in SPM	Rated Output Horsepower	*Nominal Input Horsepower	*Gallons Per Minute				
65	700	825	955	780	675	575	485
60	645	760	880	720	625	530	445
55	590	695	805	660	570	485	410
50	535	630	735	600	520	445	370

*Based on 85% mechanical efficiency and 100% volumetric efficiency.



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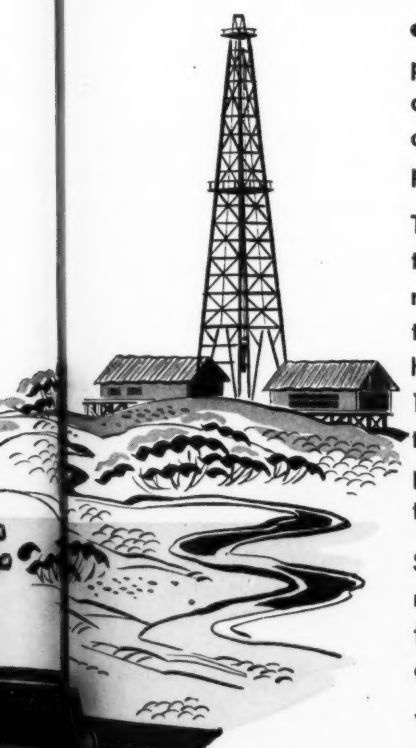

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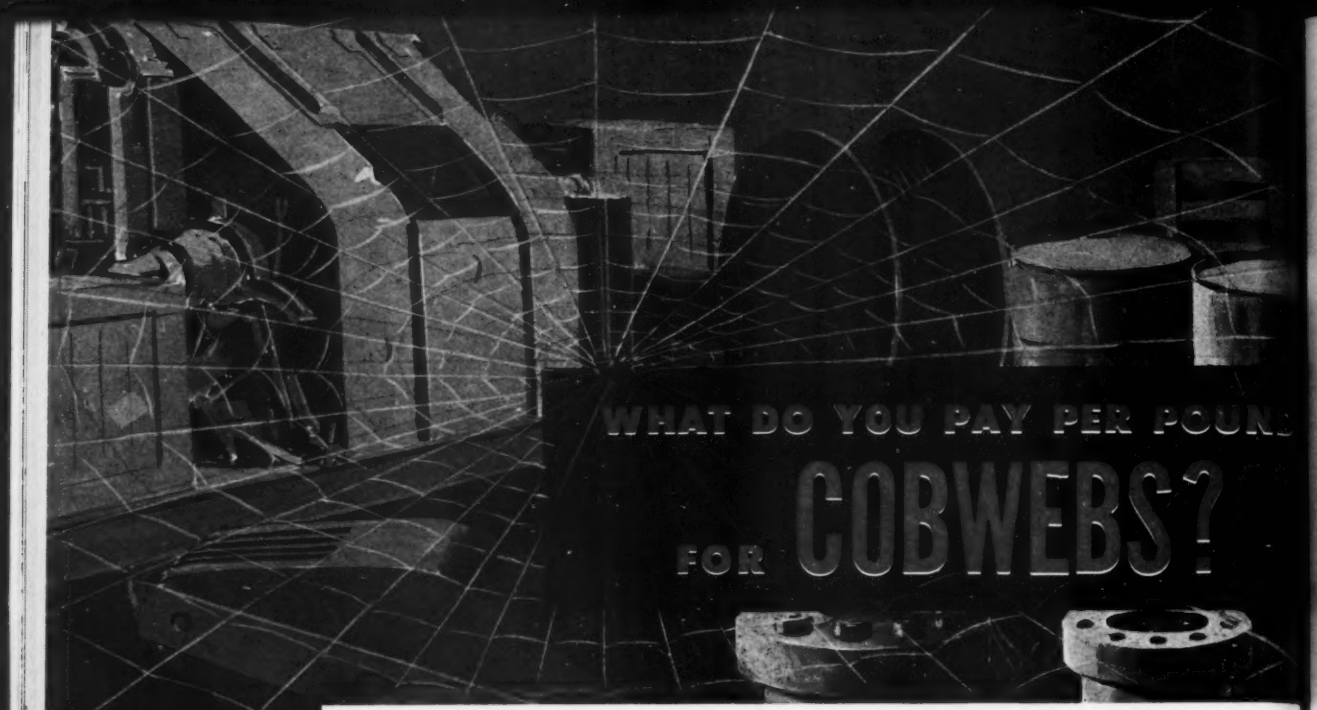

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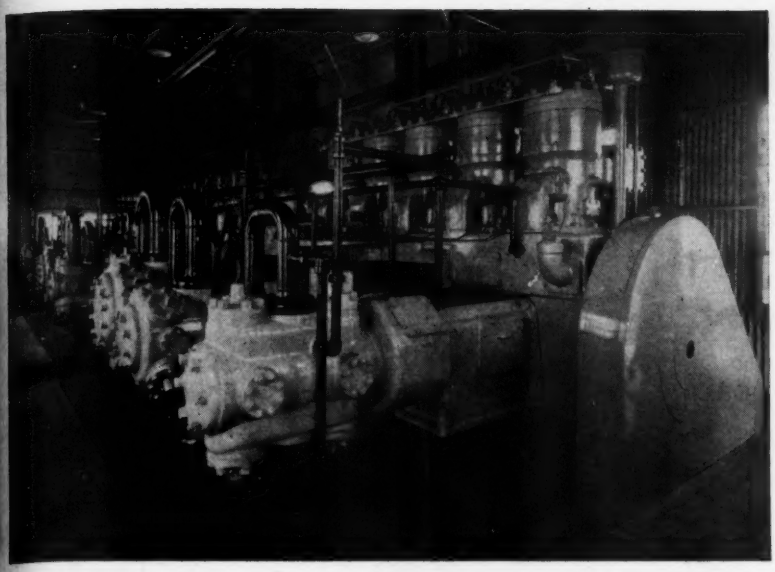


An average of 7½ million cubic feet of casing-head gas from gas-lift wells in Placedo and East Placedo is conserved daily in this small Lower Gulf Coast plant operated by Barnsdall Oil Co. These three 500-hp. units boost the gas from 15 to 750 psi. after which it is mixed with high-pressure gas production for dehydration and pipe-line delivery. The compressor plant was constructed by L. L. Dresser Engineering Co. of Tulsa

Compression, Dehydration Plant Provides Full Gas Utilization

by George Weber

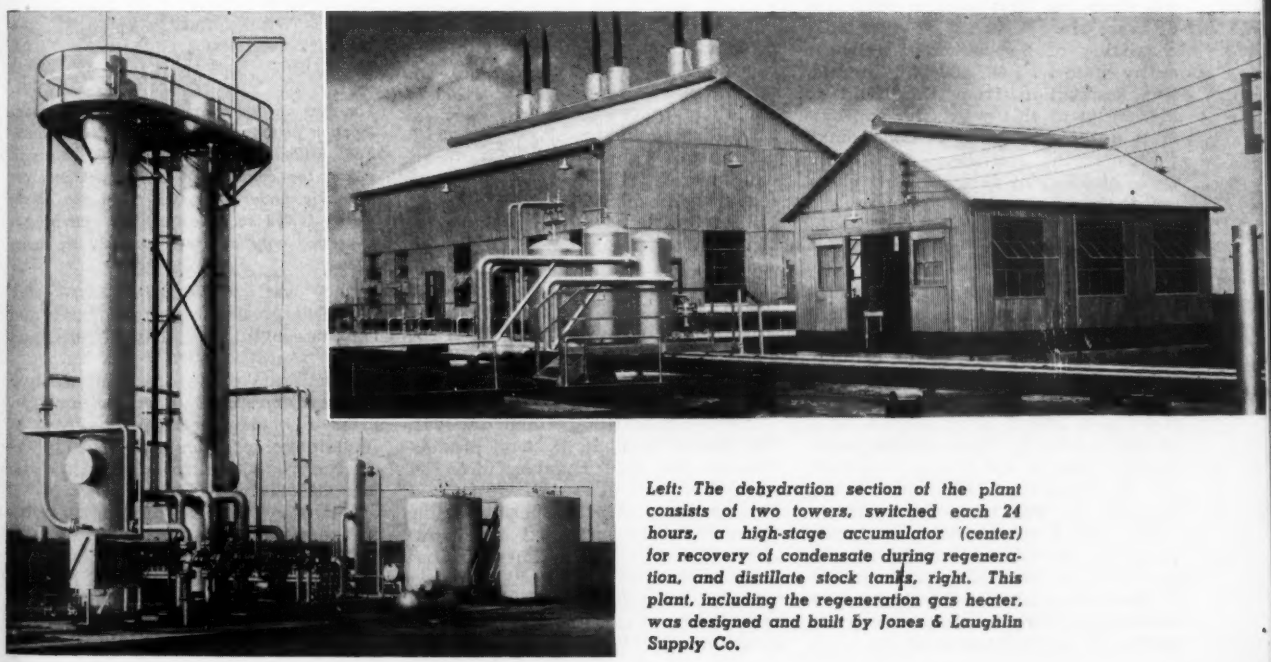
A REPRESENTATIVE example of progressive company policy regarding engineering and economic conservation, Barnsdall Oil Co.'s Placedo compressor and dehydration plant has in nearly 2 years' operation, provided total utilization of 3½ billion cubic feet of low-pressure casing-head gas. Furnishing an additional outlet for local gas-well production, the plant has delivered altogether, over 1 billion cubic feet of dry gas at pipe-line pressure to Tennessee Gas Transmission Co.

Actual casing-head gas produced with oil in the contiguous Placedo and East Placedo fields averages only 200 cu. ft. per barrel. Since most oil wells have passed the flowing stage, high-pressure gas-well production in the area is widely used for artificial lift. The addition of gas-lift gas to original casing-head gas on oil leases has made it economically possible for Barnsdall to gather all low-pressure from its own leases and those operated by Stanolind Oil & Gas Co., for compression and full utilization.

The dehydration facilities at Placedo were installed in December 1945 to provide a pipe-line market for

(Continued on page 70)

Below: Both casing-head and prime gas to the plant are lean and an absorption section is not justified. In the three scrubbers, some liquids are recovered at the intake to the first compression stage and at the two intermediate 60 and 250-psi. stages. Discharge from each stage is cooled in a Fluor tower employing Pacific water pumps powered by LeRoi engines. A total of 55 Type 38 Emco orifice meters installed in field and plant, record prime, gas-lift, casing-head, and sales gas volumes



Left: The dehydration section of the plant consists of two towers, switched each 24 hours, a high-stage accumulator (center) for recovery of condensate during regeneration, and distillate stock tanks, right. This plant, including the regeneration gas heater, was designed and built by Jones & Laughlin Supply Co.

• APPROXIMATE LOCATION OF WELLS DRILLED AS TESTS FOR OIL IN EACH COUNTY.

○ COUNTIES IN WHICH WILDCATS ARE CURRENTLY (MAY 15) UNDERWAY.

The dots on this map show the approximate location of the 199 tests for oil which have been drilled in Florida since 1900. Stars indicate the counties in which wildcats are currently under way. On the basis of the state's 58,000 sq. miles, drilling activity has averaged only one well per 290 sq. miles

Widespread Interest Being Shown in

OIL POSSIBILITIES IN FLORIDA

by Leigh S. McCaslin, Jr.

APPROXIMATELY 70 per cent of the state's 58,000 sq. miles under lease . . . 199 wells drilled for oil or gas since the first well in 1900—104 of these since 1940 . . . 1 oil field—consisting of 6 producing wells—in entire state . . . 407,500 bbl. cumulative production from this field to March 1st of this year (the approximate daily production of Oklahoma).

This is the statistical picture, oil wise, of Florida, a state more noted for its oranges, real-estate booms, and bathing beauties than its oil fields. However, the substantial acreage under lease, current wildcat activity, and long-range exploratory programs now under way indicate considerable interest in the state's oil possibilities.

As early as the turn of the century a well was drilled to a depth of 1,320 ft. by Escambia Oil Co. at the foot of Palofox Street in Pensacola. This proved to be a dry hole and the same rig, according to old timers, was then sold to Pensacola Development Co. which drilled two more nonproducers—one about 5 miles west of Pensacola in what is now New Warrington and the other on East Hill in Pensacola at the intersection of Tenth Avenue and Mallory Street. These two wells made hole to 1,702 and 1,620 ft.

After these initial attempts, interest in this West Florida area died out, according to the records of the Florida Geological Survey,[1] and the next wells were drilled in 1903 in Sumter County, central peninsular Florida. Two tests were drilled—one of which was abandoned at 1,200 ft. and the other completed dry at 2,002 ft.

It is not known why these early wells were drilled in western and central peninsular Florida. One guess is that the tests were based on surface geology. Sumter County, for instance, lies within the Ocala Uplift, a section of Florida where the Upper Eocene limestones are exposed at the surface, or only thinly covered by more recent sediments.

No Oil Until 1943

It was not until September 26, 1943, that the state got its first oil production. On that date, Humble Oil & Refining Co. brought in its 1 Gulf Coast Realties Corp. (in southern Florida, about 80 miles northwest of Miami) at total depth of 11,626 ft. Initial daily production was 97 bbl. of black, asphaltic-base, 20.8° A.P.I. gravity oil and 425 bbl. of salt water from porous limestone at 11,613-26 ft. This discovery well was pumped until May 14, 1946, when it was plugged and converted to a salt-water-disposal well.

Five years of development drilling has seen this field—named Sunniland after a nearby settlement—grow to include six producing wells. Cumulative production to March 1, 1948, was 407,500 bbl.

Current (May 15) drilling activity in the state consists of four wildcats in widely scattered areas. These tests are: Humble 1 J. T. Cone, SE NW 22-1n-17e, Columbia County; Hunt Oil Co. 2 Peavy-Wilson Lumber Co., SW SE 27-25s-34e, Osceola County; Paul S.

Olds 1 Bond Lumber Co., NE 2-15s-30e, Volusia County; and Coastal Petroleum Co. 1 Ed C. Wright, SE 7-30s-17e, on the outskirts of St. Petersburg, Pinellas County.

Coastal Has Big Program

The Coastal Petroleum test near St. Petersburg is of considerable interest as it is a part of a large, long-range exploratory program. Coastal acquired in 1946 4,500,000 acres of mostly submerged lands in the state at a cost of $1,000,000 (see map). (The acreage was actually acquired by Pantepec Oil Co. of Venezuela which was reorganized into two corporations this year—Pantepec Oil Co., C. A. and Coastal.) This acreage is broken up into three separate leases, and in order to hold all the land covered by said leases, the company is required to drill 60,000 ft. of hole in each 5-year period, and in addition thereto pay an annual delay rental of approximately 1½ cents per acre (approximately $75,000 per year). Compliance with these two obligations automatically extends these leases indefinitely for periods of 5 years each.

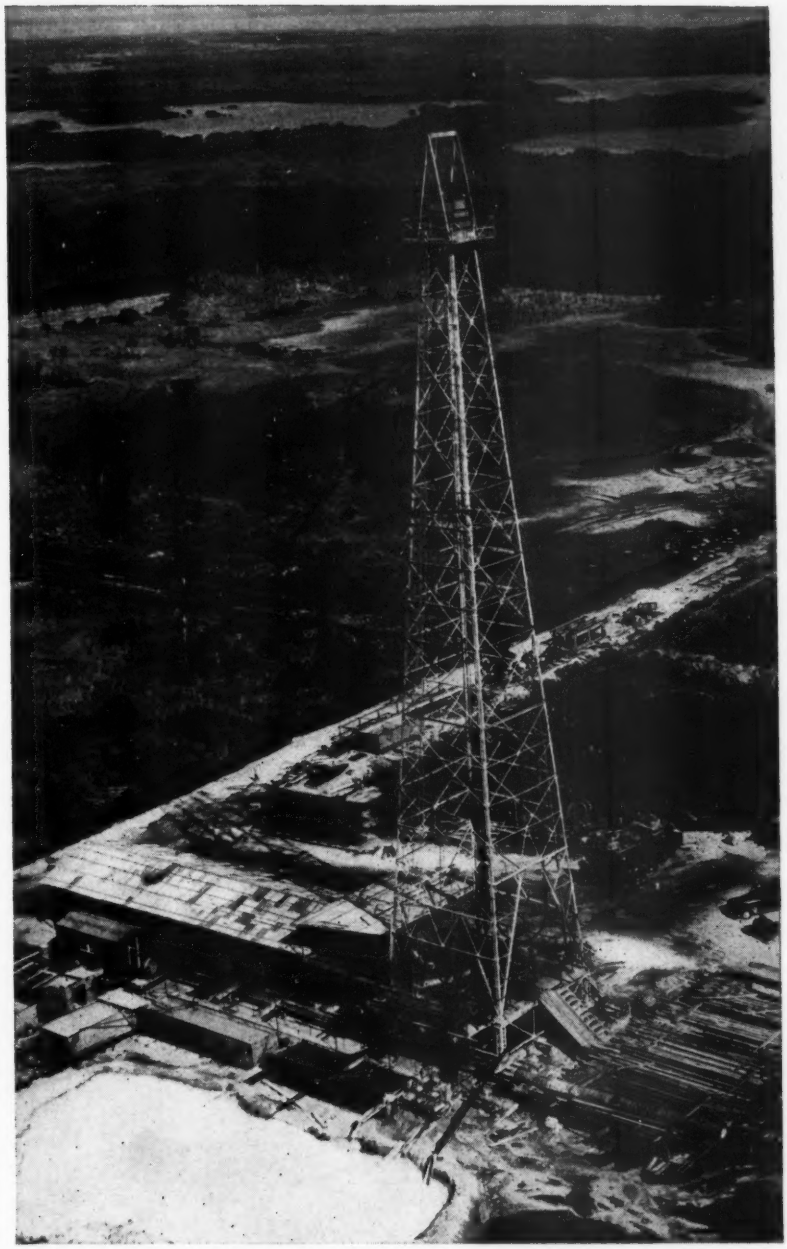
First well in the company's program was approximately 3 miles north of Cedar Keys, Fla., in Levy County. This test was bottomed at 5,850 ft. in Paleozoic rocks, having penetrated 30 ft. of Woodbine sand immediately under the Eagleford shale at approximately 4,300 ft.

The second test which is now drilling below 9,100 ft. encountered the Eagleford shale and some Woodbine sand at approximately 7,100 ft. The objective in this hole is to reach the Sunniland pay zone from which Humble is obtaining production in Sunniland field. With this in mind, the test will go to 11,500 ft. unless Paleozoic or igneous formations or production are encountered at a lesser depth.

The well at Cedar Keys was drilled by Crow Drilling Co. of Shreveport with a jackknife derrick and a power rig with three 185-hp. prime movers. The Pinellas County test is being drilled by Parker Drilling Co. of Tulsa. This rig is a diesel-electric outfit powered by two 380-hp. diesels and is capable of going as deep as drill pipe will permit.

These two tests represent Coastal's total drilling to date. The ultimate program is to drill a minimum of 60,000 ft. of hole on these leases within the next 3-year period and in several succeeding 5-year periods thereafter. Future plans are materially affected by inability to purchase casing. The expenditure necessary to complete the 60,000 ft. of hole in the first 5-year period is estimated to be from $1,750,000 to $2,000,000. Well cost to date is averaging approximately $30 per foot.

The personnel of Coastal Petroleum Co. in the St. Petersburg office consists of: J. E. Fitz-Patrick, vice president in charge of operations; B. W. Heath, vice president and secretary-treasurer; and J. E. Banks, geologist.



This deep Florida wildcat is currently under way on the outskirts of St. Petersburg. Well is the Coastal Petroleum Co. 1 Ed C. Wright, 7-30s-17e, Pinellas County, and contractor for the test is Parker Drilling Co., Tulsa. Contract is for 11,500 ft. unless Paleozoic or igneous formations are encountered at a lesser depth. Rig is a diesel-electric outfit powered by two 380-hp. diesels

Many Leaseholders

Coastal's 4,500,000 acres makes it one of the largest leaseholders in the state. Figures compiled by the National Oil Scouts and Landmen's Association show the following concerns as the leaders in acreage under lease (as of January 1, 1947):

Company—	Acres under lease
Humble Oil & Refining Co.	5,988,026
Gulf Oil Corp.	4,732,316
Pantapec-Lukes	4,562,636
Sun Oil Co.	2,247,048
Magnolia Petroleum Co.	1,824,498
Stanolind Oil & Gas Co.	1,112,954
Tide Water Associated Oil Co.	840,312
Pure Oil Co.	832,160
The Texas Co.	675,570
Ohio Oil Co.	523,989

The 28,000,000 acres under lease in the state have been subjected to a limited "going over" by the explora-

tion men. The general exploration picture has been described by E. D. Pressler[2] as follows: "The thick sand soil cover over the greater part of Florida and the scarcity of reliable outcrops minimize the value of surface geologic mapping, and the prospecting has been conducted principally by geophysical and core-drill units. The results of seismograph work generally have not been considered good in Florida. The presence of high-velocity beds at or near the surface of this area is probably a hindrance to seismograph prospecting, and it is indicated that additional experimental work is necessary to determine the proper shooting technique for the area. This is probably also true of the other prospecting methods and a large amount of additional work is necessary in Florida to evaluate properly the various prospecting methods."

At the end of 1945 there were 19 prospecting units operating in the state. However, as of May of this year the Interstate Oil Compact Commission reports only one gravity, one seismic, and two core-drill crews active.

1939—Turning Point

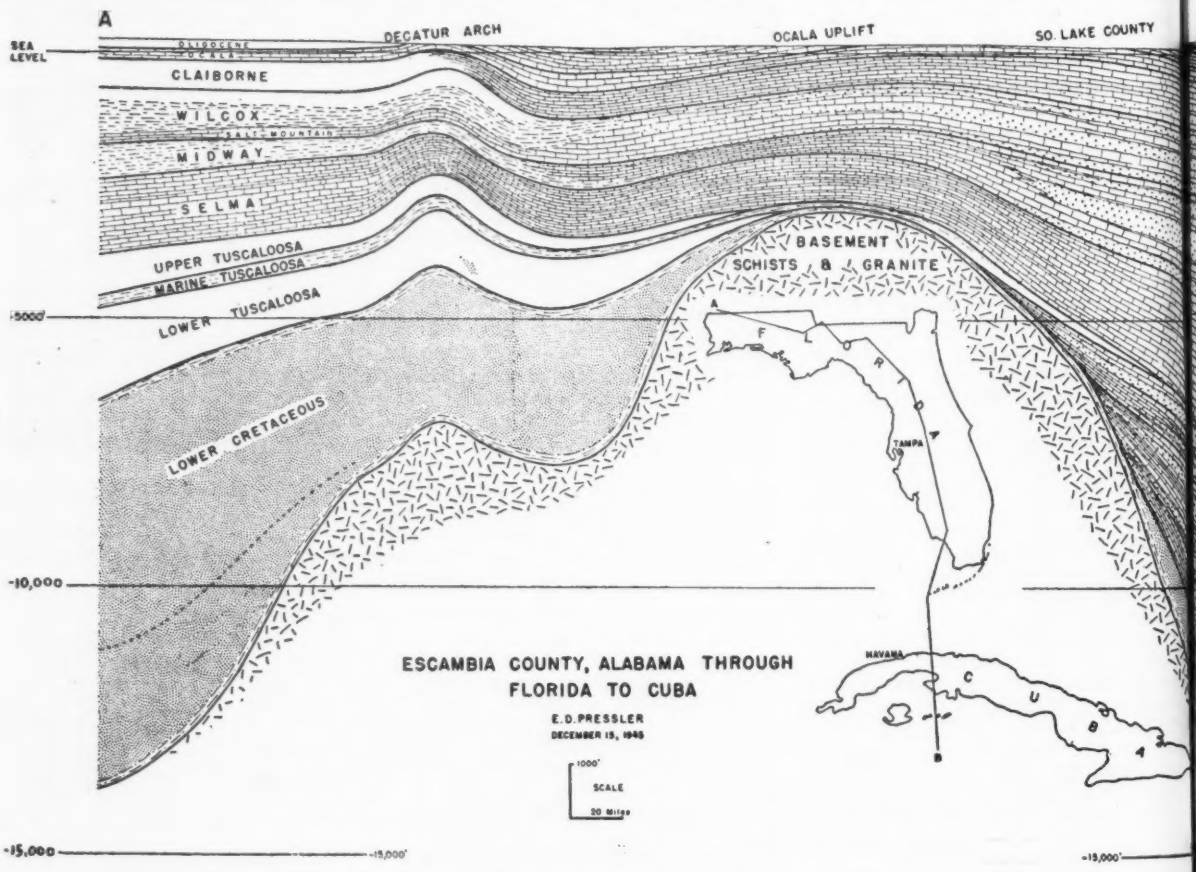
The year 1939 has been selected by one authority[1] as "an appropriate dividing point between early prospecting in Florida and the present period of prospecting by major companies." The reason for this choice was a well completed near Pinecrest, Monroe County, at a depth of 10,006 ft. by Peninsular Oil & Refining Co. This was the first really deep well in the state and in addition complete geological and reservoir data were kept on the test. Prior to this time information concerning wildcats was often sketchy and inaccurate. The Peninsular test therefore could mark a turning point in Florida prospecting, not only because of its record depth, but because of the fact that complete records were kept.

Prior to this turning point, in the 39 years from 1900 to 1939, there were 87 tests drilled, according to the records. Many of these, of course, were very shallow and hence provided little conclusive evidence as to the absence or presence of oil. A total of 112 wells have been drilled in the 9 years since 1939. This total indicates increasing interest in the oil prospects of the state. This increased activity is significant not only because of increased number of tests, but also because a large number of the tests were deep holes.

Tests drilled to date and surface geology have provided an initial working picture of the state's geologic conditions. Pressler,[2] in his paper, has described the geology as follows: "The eastern part of the Gulf of Mexico basin can be divided into the North and South Florida provinces on the basis of stratigraphy, and subdivided further on the basis of its major structural features. The southeast-striking ridge formed by the Central Georgia, Ocala, and Bahama uplifts is considered to represent the marginal flexure of this part of the Gulf basin. The Appalachicola embayment of South Georgia and West Florida has a maximum sedimentary fill in excess of 15,000 ft. of clastic sediments, and the South Florida embayment, which covers the area of South Florida, the Bahamas, Cuba, and the intervening areas, has a maximum fill of nonclastic sediments approaching 20,000 ft., and the area of the Great Bahama Bank is considered to be underlain by a section in excess of 10,000 ft. On the basis of present data, anticlines are probably the most prevalent type of structure of both embayments though faulting is undoubtedly present, and conditions are favorable for the formation of stratigraphic traps."

Difficult Drilling Conditions

Several factors combine to make drilling operations a considerable problem in a good part of the state. These factors include: (1) subsurface



Major structural features and generalized stratigraphy of Florida are shown in geological cross-section extending

formations which require unusual drilling procedures, (2) adverse terrain which hinders road building and site preparation, and (3) remoteness from other oil areas which causes operating delays when supply and service needs cannot be anticipated.

Particularly distinctive of the state and the cause for various operating problems is the coral limestone bed which underlies a large part of the Florida peninsula. This formation is several thousand feet thick in places so far drilled, is honeycombed and cavernous and capable of taking anything pumped into it. In the drilling of Humble 1 Gulf Coast Realties Corp., the state's first producer, one continuous interval of 4,023 ft., or 35 per cent of the entire hole, was drilled with complete absence of drilling-mud returns. This was further complicated by the necessity of controlling heavy water flows.

The cavernous coral limestone in the Sunniland area is found at depths of from 1,500 to 2,000 ft. and continuing to below 6,000 ft. This is overlain with porous sands and gravels in which loss of circulation also occurs almost from the surface. In this first well, large sums were spent on mud admixtures and a great deal of time was lost in attempting to regain circulation before it was decided to drill ahead without returns, using water. A heavy water flow encountered at 2,600 ft. required a mud weight of 9.4 lb. As the mud column in the annular space above the water flow could not be built up by circulation through the drill pipe, the mud-weighting admixture had to be pumped into the annular space.

Coral Depth Varies

Depth of the coral bed varies from the surface in some parts of the Florida peninsula to around 1,500 to 2,000 ft. in others. Where not at the surface it generally is overlain with loose and porous water sands and gravels which also give trouble from loss of returns in drilling surface hole. Where it lies at the surface it also contributes to certain peculiar conditions which have been faced in providing access roads and drill sites.

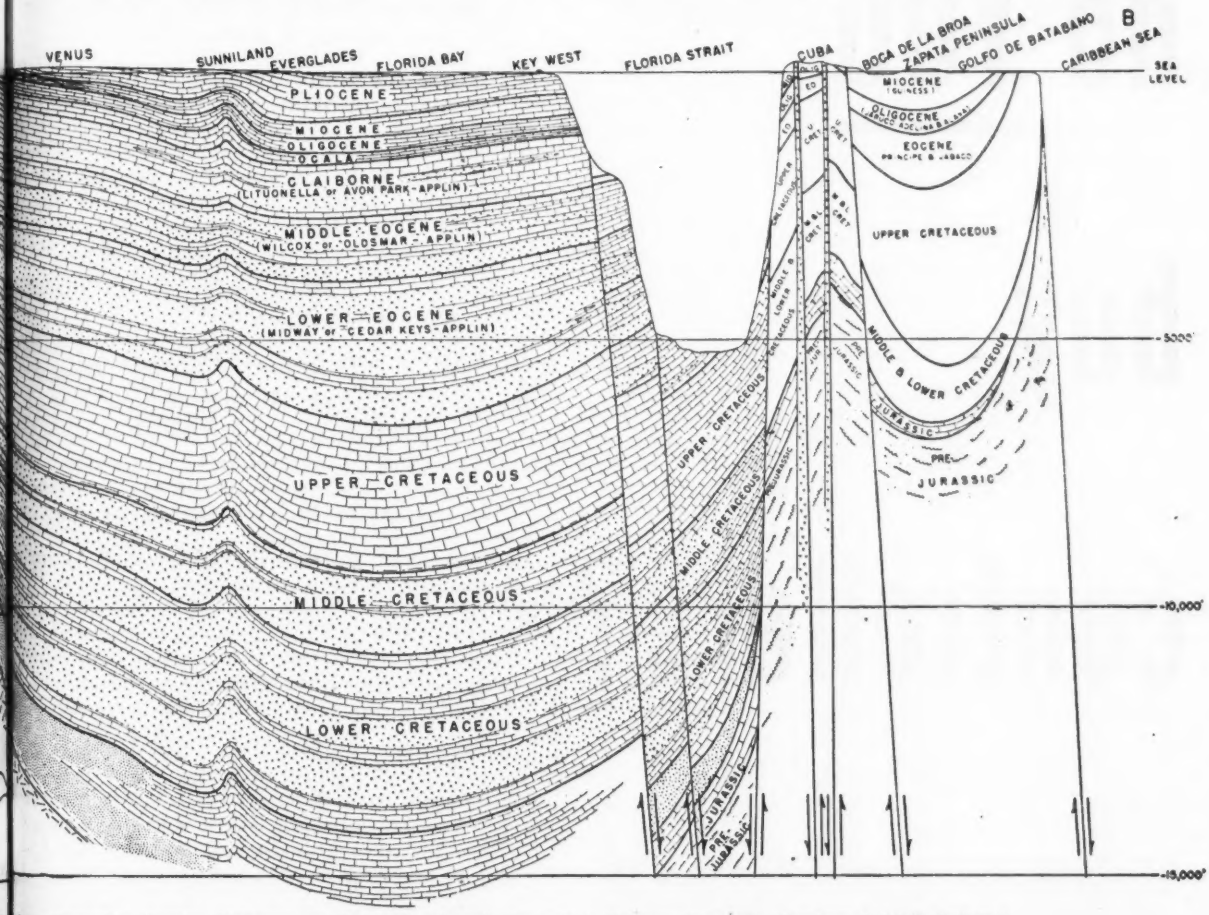
Completion Practices

The latest producer to be completed in Sunniland field is the 10 Gulf Coast Realty Co. which was brought in on January 24 of this year, flowing 175 bbl. daily.

After total depth of 11,574 ft. was reached and a drill-stem test taken, the completion procedure was as follows: Ran electric log, set 5½-in. casing, drilled out to 11,574 ft., ran 2-in. tubing to 11,562 ft., acidized with 500 gal., well flowed at rate of 48 bbl. daily through ¼-in. tubing choke with 10 psi. tubing pressure and 0 psi. casing pressure, reacidized with 1,000 gal., well flowed 152 bbl. of 24.8°-gravity oil in 24 hours through ¼-in. tubing choke with tubing pressure of 72 psi., 0 psi. casing pressure, and gas-oil-ratio of 100:1. Initial production of well was 175 bbl. flowing of 24.8°-gravity oil in 24 hours through ¼-in. tubing choke with tubing pressure of 95 psi., casing pressure of 0 psi., and gas-oil-ratio of 100:1.

An act to regulate and control the drilling and development of oil and gas in Florida was introduced and passed by the 1945 Legislature and signed by the governor on June 5, 1945. This law was patterned after a model prepared under the supervision of the Interstate Oil Compact Commission with such changes as were deemed advisable after public hearings.

In 1947, the Legislature passed an act levying a tax on oil and gas produced in Florida. This act became a law without the governor's approval



from Escambia County, Alabama, on the north, through the state to Cuba on the south. (Courtesy A.A.P.G. Bulletin)

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and was filed in the secretary of state's office June 3, 1947.

Conclusion

A good estimate of the oil situation in Florida has been given by Herman Gunter, director of the Florida Geological Survey.[1] Gunter states: "Florida is a large state with an areal extent of about 58,000 sq. miles. The sum total of 194 wells is an unimpressive number for so large an area, and it is therefore no wonder that results have not been more favorable. That production will not follow continued exploratory efforts cannot be forecast and, from the activity currently going on, it must be concluded that those carrying on such explorations have this basis—a wildcat territory with ample thickness of sedimentary formations that could yield oil if favorable traps can be found.

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Compression and Dehydration Plant

(Continued from page 63)

prime gas produced in the fields. In July 1946 a compressor unit was added and flares on the companies' leases were eliminated. The plant is now connected to a total of 64 oil wells, nearly all of which are on gas lift. Eight prime gas wells also serve the plant, providing makeup gas as demanded by pipe-line purchasers.

A 9-mile gathering system in the two fields delivers casing-head gas at an average rate of 7½ million cubic feet daily. This production is fairly uniform over daily and monthly periods. Reaching the plant at an average pressure of 15 psi., the gas is charged to three Clark 500-hp. units and compressed in three stages to 750 psi. Gas is cooled and scrubbed between stages.

Prime gas is produced from wells showing shut-in pressures of about 1,900 psi. Lease separators operate between 800 and 900 psi. where most of the distillate is recovered. The 4½-mile high-pressure gathering system converges at the plant where all incoming prime gas passes an inlet separator. It is then merged with casing-head gas from the compressor discharge for dehydration.

Two dehydrators are placed on stream at alternating 24-hour periods. On this schedule they can handle volumes much greater than the normal 17 million cubic feet daily. Gas delivered to the transmission must contain no more than 7 lb. of water per million cubic feet at normal conditions as determined by the approved Bureau of Mines dew-point method.

The fluoride agent is regenerated with hot dry gas, maintained at a 450° F. inlet temperature. Regeneration is completed in about 12 hours when outlet gas temperature leaving the tower reaches 300 F. When that point is reached, an automatic temperature control cuts fires in the gas furnace. Cool dry gas continues to pass the tower for the remainder of the 24-hour period, allowing subsequent dehydration to take place within 10° of atmospheric temperature. After nearly 2½ years of continuous service, the original dehydration agent is still giving satisfactory service and the unit has suffered no down time.

The prime gas production in the two fields, after field separation, contains almost no heavy ends and on analysis shows about 0.4 gal. per M.c.f. of butanes and lighter. The same gas, used in lifting operations, picks up little additional liquid content. Casing-head gas produced with oil is also relatively lean, testing about 0.6 gal. per M.c.f. Investment in absorption equipment is not justified, and liquid recovery at the plant is small, varying with the relative amounts of prime gas intake.

When gas wells are being pulled heavily to meet high seasonal pipeline demand, 600 bbl. of distillate per month may be recovered at the plant, most of it in the inlet separator which knocks out entrained liquids from field separators. Some liquids are recovered from casing-head gas by separation between compression stages. Additional liquid from the combined streams is withdrawn from the towers during dehydration and still more, adsorbed during dehydration, is driven off and condensed together with water during regeneration. Regenerating gas after cooling and separation of liquids, is charged directly to the pipe line, assuring 100 per cent utilization of all gas in the plant.

Drilling Stresses

(Continued from page 59)

the semicircle. This is the assumption of simple harmonic motion.

In Fig. 5, curves of twice the magnitude of A and B of Fig. 2 have been added to produce curve E, which would be the resultant if the vibration due to the drilling motion only were present. Curves A, B, C, and D, of Figs. 2 and 3, have been added algebraically to produce curve F, which would be the ideal resultant, if both the vibrations due to the drilling motion and the natural vibration were present. Curve F. should be compared to curve E. The dynamometer card of Fig. 1 has been repeated to bring out the correlation.

The writer's detailed, tentative, interpretation of this dynamometer card is as follows. Referring to Fig. 5, the bit strikes at 1, at the bottom of the figure. The string of tools recoils from 1 to 2, the coefficient of restitution being amplified by the extreme tightness of the hitch, which lowers the peak tension, as forecast by curve F. At 2, the acceleration has decreased to a point, as shown by curves B and D of Figs. 2 and 4, where the inertia no longer balances the spring force of the stretched cable, which contracts from 2 to 3, further lowering the peak forecast by F.

At 3, the operation of the natural vibration, as shown in Fig. 4, reduces the tension locally, enabling the line to dog-leg from 3 to 4, making the point of failure come about 1,950 ft. below the clamp. Unfortunately, the record of the point of failure has not been preserved. Presumably, the length of the failure or deterioration of the line is initially short, but as the drilling cable is inched into the hole, as drilling progresses, the length of the affected area is increased. This is taken as the proper explanation of why a drilling cable is able to withstand more than a few hours of drilling under these adverse conditions. This reaction is so violent in this case that the natural vibration is damped out. So, after part of the dog-leg has been pulled out from 4 to 5, the remainder of the up stroke is completed on the resultant of the drilling motion vibration E, only. The remainder of the kink or dog-leg is pulled out at 7-8 on the down stroke.

What to Do About It?

Tapering the line reduces its dead weight, hence reduces the amount of untwisting due to the weight. Also, tapering the drilling cable decreases the wave length of the natural vibration slightly, placing the local reduction in tension somewhat farther below the clamp, where the line is somewhat less untwisted.

Preforming the drilling cable[4,6] reduces the tendency of the drilling cable to dog-leg or kink, when untwisted, when the tension is reduced. Preforming also increases the modulus of elasticity, which, in turn, shortens the wave length of the natural vibration, placing the local reduction in tension somewhat farther below the clamp.

Acknowledgments

The author wishes to acknowledge the courtesy of Gulf Research & Development Co. in providing him with photographic prints of drilling dynamometer card negatives in its collection and for permitting the publication herewith of Fig. 1, which is redrawn from one such original.

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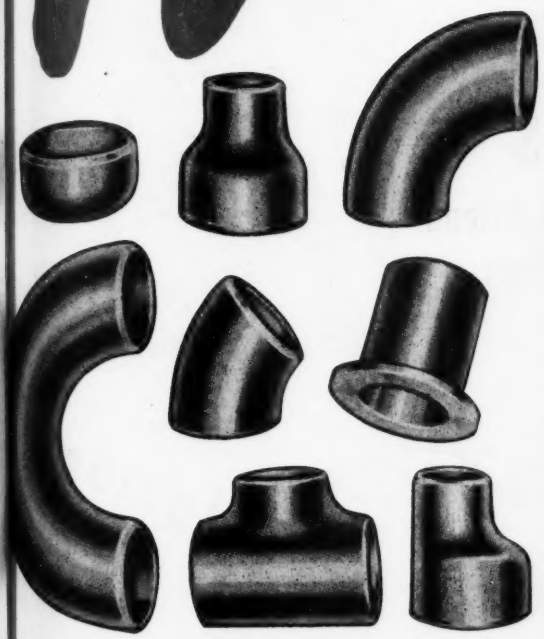
Now



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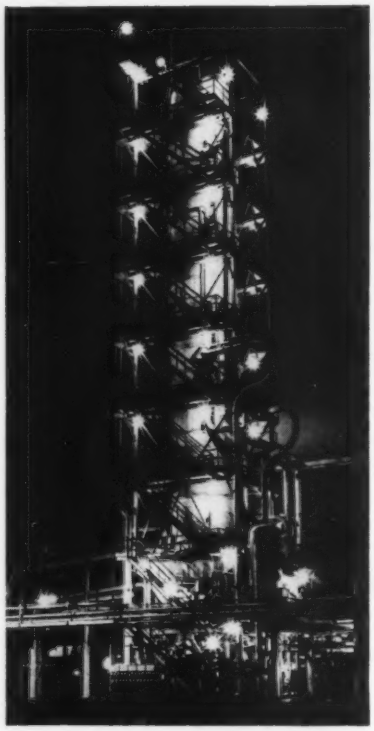
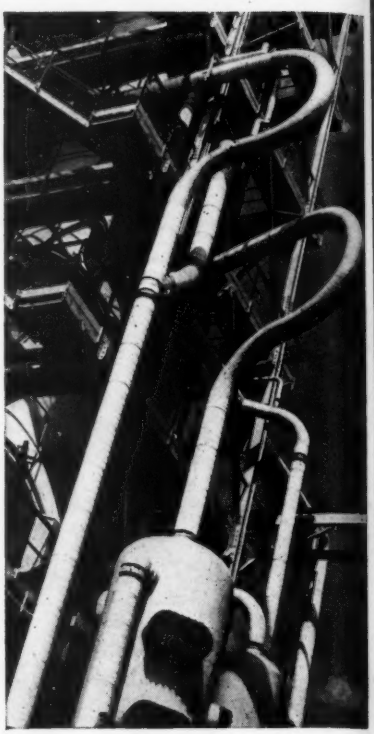


Excellent illumination is provided for the various operating areas at the Bayway re-run unit

Access to nearly any part of the re-run tower and its side columns is facilitated by ample platforms and walkways



Preplanning TURNAROUNDS, *Use of* ALLOYS Shorten Downtime, Extend Onstream Periods *for* Operating *Distillation* Equipment

by Arch L. Foster

A NUMBER of important principles must be followed if the maintenance and repair staff of a refinery is to show top efficiency in their fields, according to the experience of various refining organizations with long experience in operation and maintenance problems. Some of these principles are discussed in this article; the methods employed and results achieved by Esso Standard Oil Co. at Linden, N. J., are presented to show how these matters may be handled efficiently.

One main principle which must be followed is preplanning an entire turnaround. Under present conditions the exact daily capacity of a unit probably is of less importance than its operating factor, that is, the number of days per year during which it is on stream. This fact is especially true of primary distillation equipment, on the efficient operation of which the welfare of the entire refinery depends. Careful records of previous turnarounds are kept, and are studied to show the probable condition of various parts of the unit, to estimate what materials likely must be replaced at the next turnaround.

Careful lists are made of the numerous jobs which must be done, long before the unit is shut down for inspection-repair. One method for making up these lists is to obtain recommendations from the inspection department, process department, etc., listing repairs or replacements which they estimate must be carried out during the down period. These lists are combined by the regional engineer who, with his assistants, is in charge of the work to be done. This engineer then completes the entire plan within, for example, a month before shutdown is planned to occur. As time goes on additional items are added to the plan, to make it more complete and to schedule men and materials for all necessary jobs which can be foreseen.

Pre-Arrangements Possible

In the light of this plan, all prearrangements possible are made to further the turnaround prior to shutdown. Knowing where such jobs are to be done, scaffolds are erected at the unit in the proper place; where much scaffolding will be needed, a portable power saw is designated for the job and is placed at the site at the proper time, to cut lumber for the various jobs. New or replacement piping as far as possible is prefabricated in the shop, to reduce to a minimum the time consumption after the unit is off stream. Foremen line up their staffs, designating men to individual jobs, and scheduling these jobs in sequence and in the light of other work to be done. Jobs which require the longest periods, or which may include time delays because of fabrication are tackled first, if possible, to avoid holding up the unit at the end of the inspection-repair period.

Loudspeaker systems are installed on the more scattered, diversified jobs, to save time and to maintain contact between work directors and staffs, foremen, etc. Mobile storerooms are fitted with all tools which anticipation shows may be needed on the individual job, and at shutdown are placed near the unit to reduce lost time in supplying tools neded. Where at all advisable permanent platforms, scaffolds, and substructures are built into units, instead of installing temporary equipment at each turnaround.

Much preventive maintenance is carried out regularly by the maintenance department. Electric motors

and other equipment in full-time service are scheduled to go to the repair shop at regular intervals for the replacement of worn bearings, or valves and other working parts which require periodic attention. These units must be repaired and returned during turnarounds, of course. Some equipment must be serviced during operation, which may include various matters pertaining to valves, pumps, or instruments.

The instrument department has a regular system of inspection of different types of instruments, the intervals being determined in the light of experience with each type. Unless an instrument is of the automatic control type, or if control may be managed manually for a time, the instruments of a unit may be inspected and repaired while "on the board" in service, being disconnected temporarily while the work is going on.

All these systematized methods have reduced the shutdown and offstream time for turnaround of distillation units at Bayway, for example, from 3 to 2 weeks, and then more recently to 6 days, in specific instances. It is highly economic to utilize extra-time work with its time and a half or double-time pay to complete a job early, if the saving in production time is valuable enough to warrant the extra costs. To supply several thousand barrels more product in an emergency such as fuel oils for winter demand additional overtime cost may be justified frequently and is used if the economic balance is favorable to it.

In all major turnaround jobs, one engineer is assigned to observe the entire procedure, point out improvements, make notes and later report on all that was done, with suggestions for bettering future turnarounds.

Use of Alloys for Replacement

Similarly, if alloys for various items will lengthen the on-stream periods and speed up the turnaround time, their use is justified in practically every case. Frequently the monetary loss in product made during 1 or 2 days, or a week of extra repair time lost on a single unit runs into several thousand dollars per day. An increase in material price can be more than offset by the extra production which comes from being back on stream a day or two sooner, or from reduction in the number of turnarounds necessary per year, by the use of alloys.

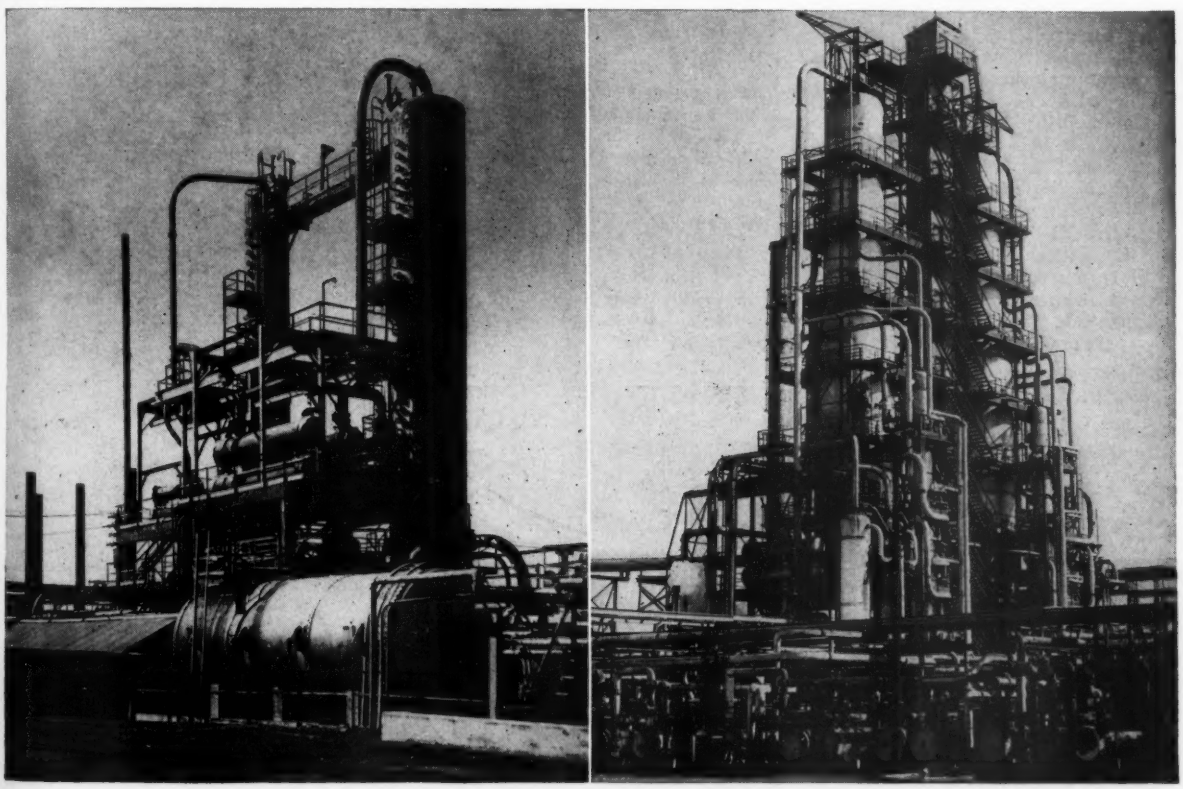
In distillation service in high-temperature operations this refinery has standardized on two main types of alloy tubes and piping. For the less-severe locations, 4-6 per cent chrome, ½ per cent molybdenum pipe and tubes are employed. If this alloy is not resistant and long lived enough for the job, then normally 18 per cent chrome-8 per cent nickel steel alloy is installed. Header boxes are also made of either one or the other of these two alloys, the choice depending on the service conditions and earlier experience with the individual situation. Coil outlet (transfer) lines are also of these alloys, wherever corrosion-erosion problems are met. Experience has shown that one type of corrosion is met in the hotter parts of a distillation unit, while a different type of corrosion is found in the cooler sections, and each type requires a different handling for optimum results.

For another example, the naphtha line from the top of rerun stills may use a KA4 type of alloy (18Cr-8Ni-2-3 Moly). The same material makes good as impellers and casings for centrifugal pumps handling overhead products. Tubing in condensers for overhead products may be admiralty metal or 70-30 Cu Ni alloy, depending on the specific situation encountered. Muntz-metal bolts in condenser boxes have shown long life. Nine per cent chrome alloy has been used in some places such as cyclone tubes in catalytic cracking; Ni-Resist and Duraloy have also been used successfully.

In hot accumulators 18-Cr, 8-Ni alloy or 11-13 per cent chrome alloy is employed. Earlier lined pipe was used but it was found that the lining would collapse and buckle, closing the pipe and causing serious stoppage, so this system was discontin-

(Continued on page 76)

Left: Pentane plant at Esso Standard Oil Co. Bayway refinery. Right: Atmospheric crude units Nos. 2 and 3 at Bayway plant, Linden, N. J.



Ohio Oil Co's Midget L. P. G. Plant Produces 350 Bbl. Per Day

by R. B. Tuttle

Unit at Robinson, Ill., operated to produce material having a vapor pressure of 200 psi. at 100° F.

EXCESS overhead make from a depropanizer column, which is operated in connection with a polymerization unit, is processed in a supplemental unit for production of liquefied petroleum gas at the Robinson, Ill., refinery of The Ohio Oil Co. The L.P.G. plant, designed and built entirely by refinery personnel, is constructed largely of salvaged equipment. Designed for a normal production rate of 250 bbl. per day, the unit was placed in operation early this year and has produced as high as 350 bbl. per day of 225-psi. vapor-pressure material.

The plant shows excellent operational stability within the range of 100 to 350 bbl. per day on production. Stored in three horizontal-type 30,000-gal. bulk containers, adjacent to the refinery, the L.P.G. material is delivered to consumer points by another company.

Flow arrangement of the unit is conventional as illustrated by the accompanying diagram. The automatic

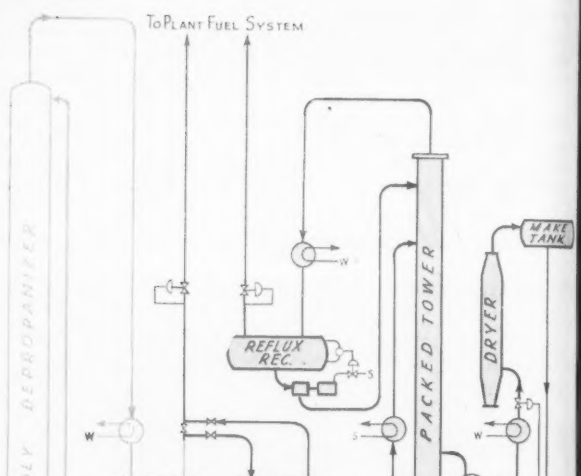
(Continued on page 76)

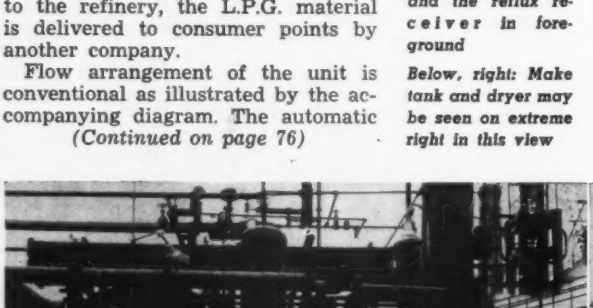
***Above:** The equipment in the foreground and to the right comprises the small L.P.G. extraction plant*

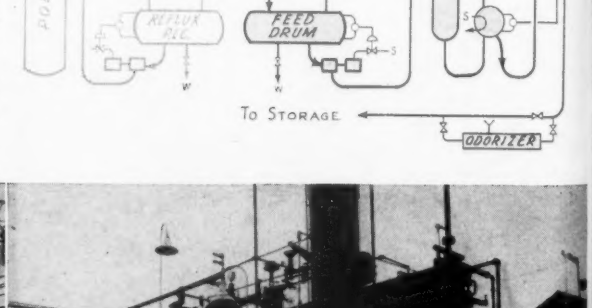
***Right:** Schematic flow arrangement of the midget unit. The shaded lines indicate equipment in another process*

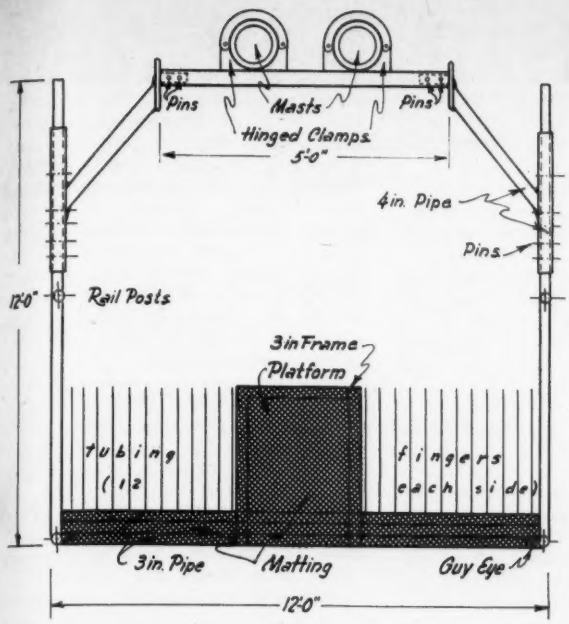
***Below, left:** Unit's operating area showing base of tower, on right, stairway leading to a platform from which operations may be controlled, and the reflux receiver in foreground*

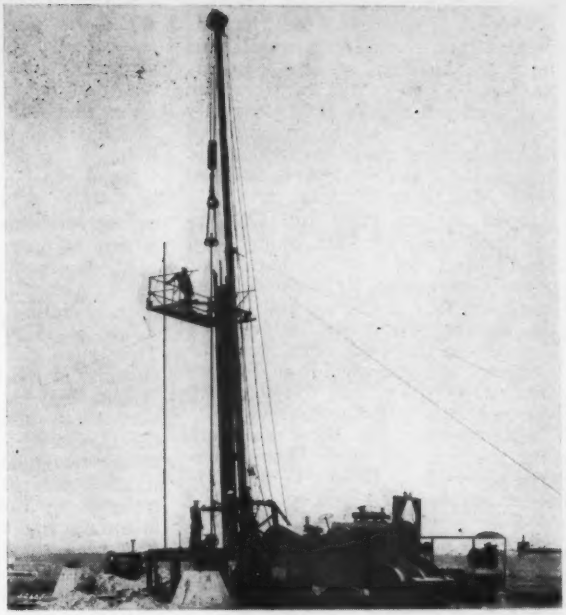
***Below, right:** Make tank and dryer may be seen on extreme right in this view*











Left, above: This demountable tubing platform, designed and fabricated locally for Barnsdall Oil Co.'s Lower Gulf Coast operations, saves considerable time on workovers by allowing crews to stack tubing instead of laying it down. The frame, of welded 3 and 4-in. pipe members, telescopes for required length. The tubing racks will hold full tubing strings, in singles, for any district workover jobs. Right, above: This single-mast hookup attaches to the pulling unit complete with all accessories. A heavy substructure of 8-in. H-beams and 7-in. pipe posts is welded in one piece. The two guy lines attached to the back corners of the platform are added for increased steadiness on the one-mast unit

Tubing Boards on Mobile Servicing Units Speed Workover Jobs

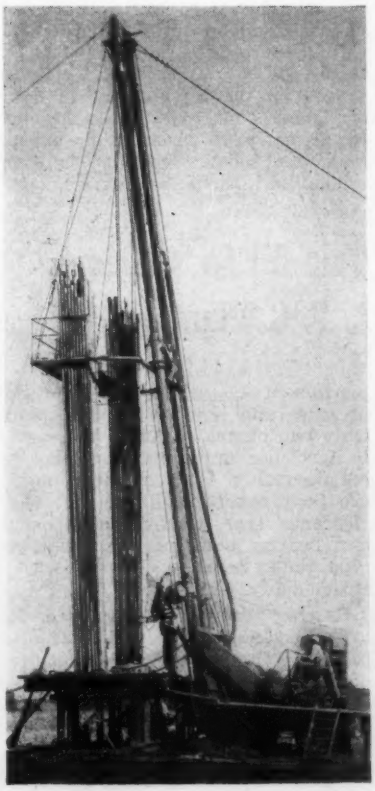
DEMOVABLE tubing boards, attached to one and two-mast mobile well-servicing units are greatly expediting workovers in Barnsdall Oil Co.'s Victoria district lower Texas Gulf Coast. The platforms, fabricated locally from 3 and 4-in. pipe stock, allow crews to stack tubing in singles in the mast instead of laying down. For an average 4,700-ft. well, 2½ hours can be cut from every round trip.

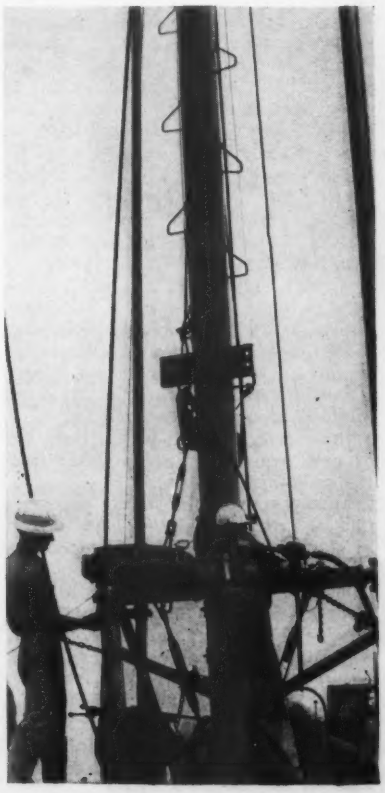
The boards are installed at present on two company servicing units. The first so equipped was a Wilson Super dual-mast unit. The tubing rack proved so successful that when an Allis-Chalmers-Fred E. Cooper single-mast winch tractor was purchased, the same type of platform and rack was immediately installed.

The tubing boards are designed for complete disassembly for moving. Attached by pins to the single mast unit, and by hinged clamps to the dual mast, they are suspended at the two front corners by guy lines to the crown assembly. The single-mast unit is further steadied by ground guys at the two back corners.

Each platform is adjustable in length, the 3-in. outer frame telescop-

Left, below: This dual-mast unit, with tubing platform attached, will allow a reduction of 2½ hours on round trips with tubing in a 4,700-ft. workover job. Right, below: Air-operated tubing tongs are standard on both servicing units. Note the plate on the mast, where the traveling block rests in transit





ing in 4-in. sleeves for various selected lengths from 9 to 12 ft. The derrick man works on a small platform at the front of the platform, flanked by two tubing racks, within easy reach. The racks have a capacity for 6,000 ft. of 2½-in. tubing and have taken as much as 7,000 ft. of 2-in. string. Each platform is attached about 28 ft. from the mast base.

Masts on both units are 10¾-7⅝-in. telescoping from 65 ft. when rigged up, to 34 ft. for moving. The single mast is supported by eight 9/16-in. guy lines, four at the top and four at the middle, two of the latter being attached to the back corners of the platform. The dual mast is guyed with only three lines; one 1⅛-in. back line and two 9/16-in. front guys.

Substructures for both units are fabricated in one piece. They comprise 8-by-12-ft. frames of 8-in. H-beams welded to 4½-ft. posts made of 7-in. pipe. Both units use air-operated tubing tongs. Lines are never unstrung for a move. Rigging-up time on the dual-mast unit averages 4 hours.

Preplanning Turnarounds And Use of Alloys

(Continued from page 73)

ued. Steel lines are used for strong sulfuric acid. For weak sulfuric, brass is normally employed. For some acid concentrations lead-lined pipe has been used successfully, also carbon piping. Valves for these lines are frequently built of an alloy, containing 48 per cent iron, 24 nickel, 19 chrome, 3 molybdenum, 3½ silicon, and low carbon, and such valves stand up very well in the service. Valves and pipe of this alloy are generally of cast construction.

Fractionator towers are lined often with either 11-13 per cent chrome steel, or 18-8 for the most severe conditions. Lower trays in some towers may be of stainless steel (11-13 per cent Cr), including caps and risers, for the lower 8 to 10 trays. In special cases, as will be mentioned later, monel metal is a satisfactory solution of certain corrosion problems. Where towers corrode at the tray level, an alloy strip may be welded in.

Practically all salt-water lines are of cast iron. Some fresh-water lines use galvanized steel.

Flue-gas breechings may be fortified against corrosion-erosion effects in some cases by lining the bottoms with brick. In repairing tank bottoms, holes are patched and a 4 to 6-in. layer of concrete may be put down, to save the bottom further corrosion. A gunite lining, of cement and sand, is put on knockout drums, normally about ½-in. thickness, to minimize corrosion. For outside protection of metal surfaces, aluminum paints have shown good results.

Piping insulation is covered with a fire-retardant type of heavy paper, as protection from both fire and the elements. Where plain steel wire rusts out rapidly to allow insulation to bulge and fall off, alloy wire up to 18-8 has been used with much longer life.

Numerous innovations are employed in setting up a unit for inspection, or for conditioning various items in or out of operation. For example, a light, low-boiling oil stock may be fed to a distillation unit, which has been operating on a heavy stock, for a few hours just prior to shutdown. This simplifies the emptying and cleaning of the towers and lines. The system may be steamed out, or a water wash may be used to clean up the system for inspection and repair. Steam turbines may build up deposits on blades in service, reducing efficiency. By injecting water into the incoming steam to "kill" superheat and produce wet steam, these deposits may be washed off, restoring the unit's efficiency in a short time.

Additional, unforeseeable work shows up always on a turnaround, which is another excellent reason why all possible preplanning is used which will clear the way to handle these unforeseeable jobs as fast as possible, to avoid extending the downtime. Additional jobs will come to light between the time the first plan is worked out and the date of shutdown and the regional engineer rearranges the plan in the light of the new items. The plan must always look to the maximum use of available man-hours, to avoid congestion of jobs in any given time period. Locating spare tube bundles, for example, of various sizes and services speeds up the replacement of damaged bundles by permitting the staff to know just where replacements may be found without "hunting around" for them.

Ohio Oil Co.'s Midget L. P. G. Plant

(Continued from page 74)

instruments employed in the unit are pressure and liquid-level controllers. Only two pumps are used; one serves to feed the unit, and the other to handle reflux. Both of these pumps are reciprocating units of the close-clearance type. Cooling, condensing, and heating equipment are fintube-type units and the column is constructed of 24-in. pipe.

Raschig rings are employed for tower packing which varies from 1 to 1½ in. in size. With the exception of 2-ft. zones at its bottom and at its feed-inlet section, the column is packed with 1-in. rings. Feed and bottom sections, a total of 4 ft., are packed with 1½-in. rings. The packed section of the column, including both inlet and bottom sections, is 35 ft. Employment of two different size Raschig rings for the column is not a design specification. The two sizes were installed because the desired quantity of rings of one size only were not available from refinery stock at the time the column packing was installed. Larger rings were placed at the inlet for disengaging space and in the bottom section to permit higher liquid loading. Also, smaller rings were indicated to serve best in the contacting section of the column since they provided more surface per unit volume.

Piping Varies

Piping for the unit ranges from 1½ in. for its feed line to 6 in. for the vapor line from the reboiler. Both pumps are connected into their respective receiver drums with 2-in. suction lines. The overhead line from tower to condenser is 3 in. whereas 2-in. pipe connects the condenser to the reflux drum. Liquid from bottom of the tower to reboiler is run through a 4-in. line and product is taken off through 2-in. pipe. The back-pressure valve at the reflux drum discharges to the plant fuel system via a 1½-in line.

The unit's feed surge drum is connected to the depropanizer reflux drum so that excess material only is fed to the L.P.G. unit. This is accomplished by connecting the feed-drum filling line into the top of the reflux drum as indicated in the accompanying diagram. A three-valve manifold at the takeoff connection permits excess gas from the depropanizer to be cut into the plant fuel system when the L.P.G. plant is not in operation. Depropanizer gas in excess of the L.P.G. unit feed requirements is run to plant fuel through the same back-pressure valve which controls the excess gas from the depropanizer when the L.P.G. plant is not operating. The depropanizer reflux drum thus provides additional water settling.

Currently the L.P.G. unit is operated to produce material having a vapor pressure of 200 psi. at 100° F. This material is equivalent to N.G.A.A. - specification L.P.G. having a vapor pressure of 225 psi. at 100° F. The product is free of water and even though no moisture is indicated in the material upon leaving the product cooler, it is passed through a caustic dryer before going to the unit's make tank. On leaving the make tank for bulk storage the product is given a final check for moisture.

Operating pressure on the depropanizer is 300 psi. and that on the L.P.G. column 480 psi., or slightly higher pressure. Finished L.P.G. is odorized before delivery to bulk storage. The odorant is batch fed into the product transfer line at the unit, as indicated in the diagram.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

An Explanation of Retrograde Condensation

I would like an explanation or would like references to an explanation as to why hydrocarbons in the liquid state can be compressed to a vapor state. This condition occurs in gas-condensate reservoirs under extremely high pressure and liquid hydrocarbons are recovered by a reduction in pressure (retrograde condensation).—E. F.

The statement of the question is only partly true. Although gas is pumped into the reservoir by compressors, the liquid hydrocarbons that issue from the reservoir with the recycle gas are gases only in that they are dissolved into a large amount of high-pressure gas. If the liquid were not associated with the high-pressure gas, compression of it (the liquid) would not cause it to vaporize. The general situation is summarized by the idealized figure on this page for light hydrocarbon mixtures. Several operations are indicated on Fig. 1.

Distillation.—If a cold liquid (a) is heated at a constant pressure it will begin to boil (the bubble point) as it enters the two-phase region. Distillation or vaporization will then proceed as the temperature is raised until distillation is complete at the end point (or dew point). More temperature only superheats the gas to the point designated by (b).

Condensation.—Likewise the hot gas (b) if cooled will reach its dew point and start to condense. More and more condenses as the temperature is lowered until finally complete condensation occurs at the line which marks the end of the two-phase region. Further cooling of the liquid brings it finally to the original condition of liquid (a).

Compression.—If the low-pressure gas of point (c) is compressed at constant temperature, it will start to condense at its dew-point pressure. Further increase in pressure causes more condensation until the gas is completely liquefied. Finally, the liquid is compressed to point (d) which represents an extremely dense material which may be termed a liquid because it is nearer the liquid region than the gas region.

Expansion.—Expansion of the liquid (d) back to the gas (c) can be accomplished by reducing the pressure at a constant temperature. This operation would involve bubble formation, vaporization, and finally complete evaporation.

Retrograde condensation.—This is indicated by the line (e)-(f). The material in the reservoir is the extremely dense material indicated by point (e). It is not strictly a gas, nor is it a liquid because it lies almost equally away from what we know as ideal gases and what we know as typical liquids. This material (e) is expanded (and cools itself somewhat) so that it cuts into but not directly across the two-phase region. Distance into the two-phase envelop at this side, is related to the amount of liquid formed and hence at some intermediate pressure on the line (e)-(f), a maximum amount of liquid is produced. Further reduction in pressure results in evaporation of the liquid already produced until finally all of it disappears and a true gas material results.

All of the above discussion is merely a statement of the facts without regard to why they occur. The following is one explanation of retrograde condensation. The molecules at point (e) are so close together because of the extremely high pressure that they possess in some degree the properties of a liquid, particularly the property of dissolving other liquids or even solids (Nelson, W. L., Solubility of Salt in Steam, The Oil and Gas Journal, May 31, 1947). The phase at point (e) is so dense because of the pressure that it is substantially as dense as the liquid within the two-phase region. As the pressure is reduced the molecules spread apart and gradually lose their ability of holding liquid molecules in solution until finally liquid begins to separate. However, as the pressure is reduced still further, the liquid mixture is below its vapor pressure and it vaporizes, completely so at the lower line of the two-phase region. The low-pressure gas phase of point (f) is so lacking in density that it is not at all like the so-called gas phase of point (e).

The mechanism just enumerated cannot occur with a single pure material. It is necessary that several components be present so that some of them are affected differently from others by changes in the pressure or the temperature. Thus, the lightest or smallest molecules can be compressed according to the general behavior of what we call gases but they have such great repulsive forces between them that they cannot ordinarily be brought together into what we call a liquid. Under the same conditions, certain of the heavier molecules which somewhat lack repulsive forces can find each other and associate with each other to separate into liquids, or partially associate themselves with the light molecule as at point (e) in the condition which we call a solution.

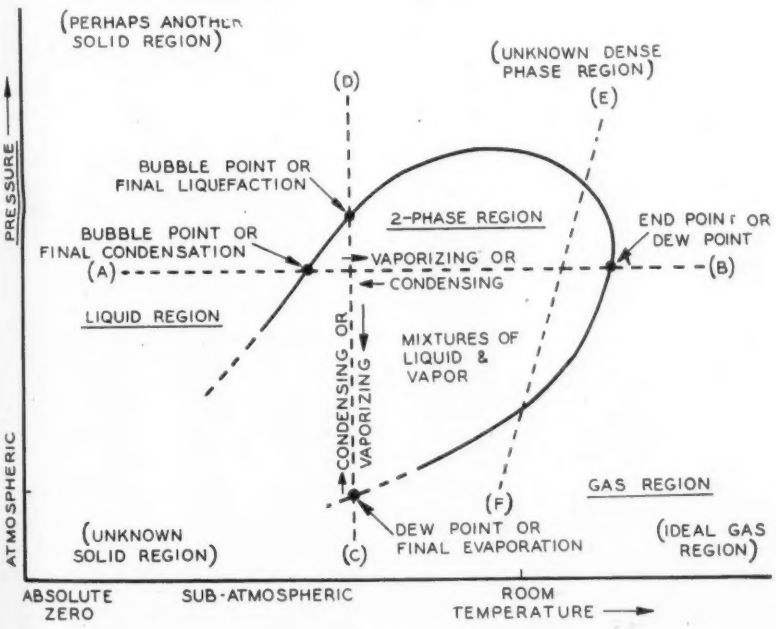


Fig. 1—Idealized phase relations for a light-hydrocarbon system

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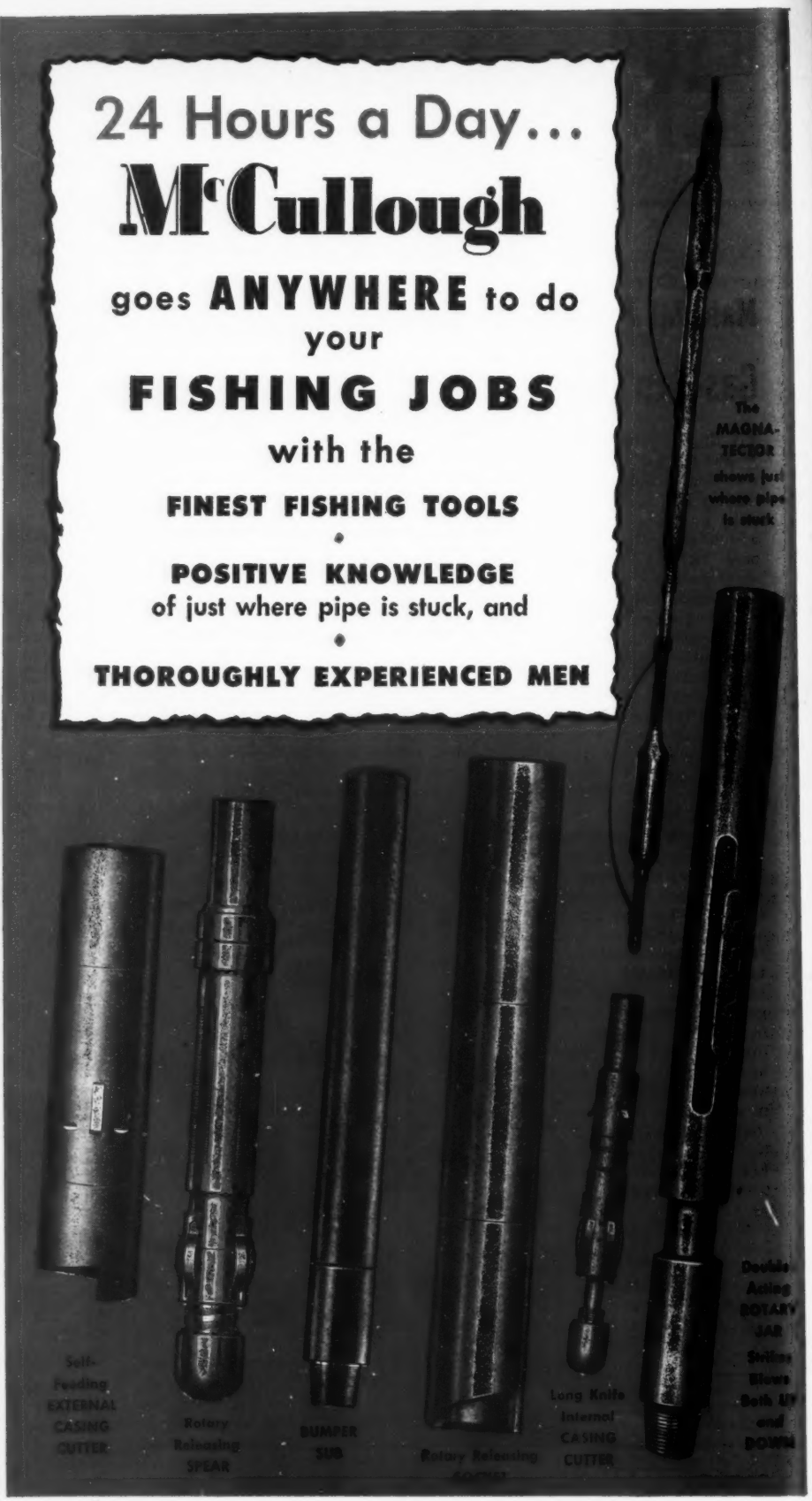
The MAGNA-TECTOR shows just where pipe is stuck
Soft-Feeding EXTERNAL CASING CUTTER
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BUMPER SUB
Rotary Releasing
Long Knife Internal CASING CUTTER
Double Acting ROTARY JAR
Strikes Blows Both UP and DOWN

ENGINEERING *fundamentals*

Material Balance Equations to Include

Gas-Cap Volumes, Water Encroachment

IN Engineering Fundamentals No. 333 a material balance equation was developed for a reservoir having no gas cap, no water production, or water encroachment and which was of a definite constant pore volume. Although such an ideal case is not met within practical operations, the equation is a good beginning point for a theoretical analysis. In the present discussion the material balance idea will be extended to include a gas cap and water encroachment.

As before, the reservoir volumes are considered first at the original state when the pressure was P_o and then at some future time when the cumulative oil withdrawal has been ΔN barrels of stock tank oil, the cumulative gas production has been $\Delta N \times R_c$ standard cubic feet, the water production has been w barrels, the water that has encroached into the space originally occupied by oil has been W barrels and the reservoir pressure has fallen to P. The reservoir initially is assumed to have contained free gas over and above that which was in solution and the reservoir volume occupied by this gas is defined as $mN\beta_o$. Since the original oil volume is by definition $N\beta_o$, the term m represents the ratio of the original reservoir gas cap volume to the original reservoir oil volume. Fig. 1 shows an idealized cross-section representing the relative reservoir volumes of oil and gas originally and the relative reservoir volumes of oil, water, and gas when the pressure has fallen to P.

The balance between the two situations shown in the figure can be expanded from the basic balance given previously (Engineering Fundamentals No. 333) as (1) S.C.F. of gas originally in reservoir = S.C.F. gas produced + S.C.F. gas remaining in reservoir. The expansion of these terms is shown diagrammatically in Fig. 2 using the terminology given below.

The equation which results after collecting the terms shown and after substituting $u = [\beta + (r_o - r)v]$ and $u_o = \beta_o$ is:

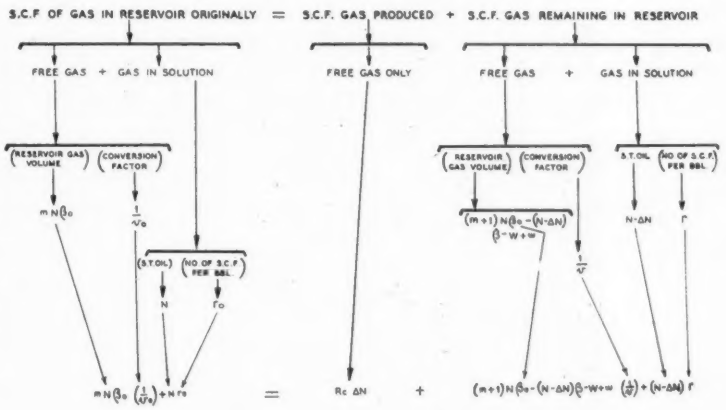
$$N\left[(u - u_o) + mu_o\left(\frac{v - v_o}{v_o}\right)\right] = \Delta N\,[u + (R_c - r_o)v] - W + w \quad (2)$$

which equation relates the amount of cumulative oil production to the properties of the reservoir fluids, to the pressure decline, to the amount of gas and water production, to the magnitude of gas cap and to the amount of water encroachment.

Terminology

- N = the number of barrels of S.T. oil which were originally in the reservoir
- ΔN = the number of barrels of S.T. oil which have been produced up to the time the balance is made
- r = the number of S.C.F. of gas which will dissolve in 1 bbl. of S.T. oil under the pressure P which exists at the time the balance is made
- β = the formation volume factor at P, i.e., the volume occupied in the reservoir at P by 1 bbl. of S.T. oil plus the amount of gas, r, held in solution
- β_o = the formation volume factor at the original pressure P_o, i.e., the volume occupied in the reservoir at P_o by 1 bbl. of S.T. oil plus the amount of gas, r_o, held in solution
- v = the space in barrels occupied in the reservoir at P by one S.C.F. of gas when not in solution, equal to $\frac{Z}{5.62}\,\frac{14.7}{P}\,\frac{T_f}{520}$ (Eng. Fund. No. 305)

Fig. 2—Expansion of material balance equation



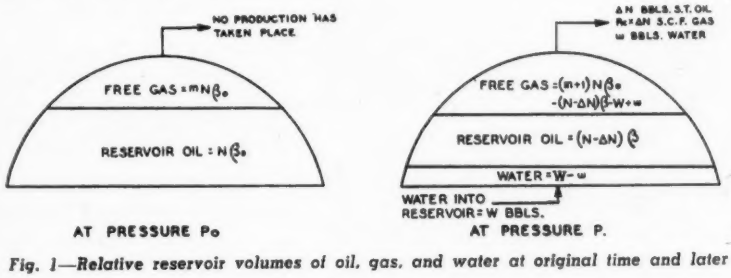


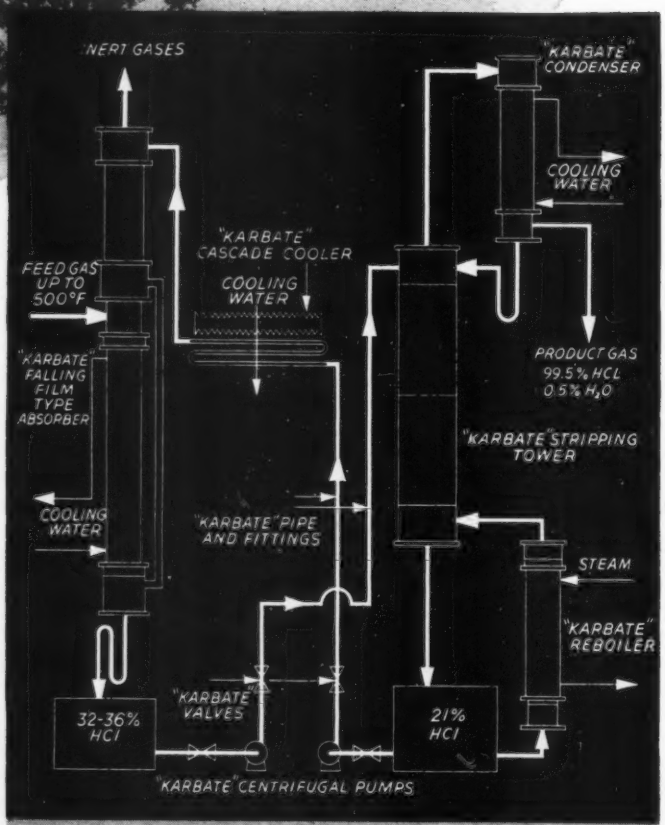
Fig. 1—Relative reservoir volumes of oil, gas, and water at original time and later

- v_o = the space in barrels occupied in the gas cap at P_o by one S.C.F. of gas
- T_f = the reservoir temperature
- R_c = the gas-oil ratio on a cumulative basis, equal to total gas production divided by ΔN
- $u = \beta + (r_o - r)\,v$, or the space in barrels occupied in the reservoir at P by 1 bbl. of S.T. oil plus all the gas which was dissolved in that oil at the original pressure P_o
- $u_o = \beta_o$
- m = the ratio of the original reservoir gas cap volume to the original reservoir oil volume

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

MAKE ANHYDROUS HCl?

Whip corrosion with "KARBATE" Impervious Graphite Equipment!



A typical flow sheet of one system for producing anhydrous HCl from feed gases up to 500 deg. F. containing inert gases.

IF YOU manufacture anhydrous HCl for use in the production of plastics, alkyl chlorides, synthetic rubber, or other materials, you can eliminate corrosion permanently by using "Karbate" Impervious Graphite corrosion-resistant equipment. The *entire* system can be assembled of *standard* "Karbate" units, including acid absorbers, cascade coolers, towers, heat exchangers, pipe, valves, condensers, pumps, tanks, and fittings. This equipment has the following advantages:

1. **Chemically inert to all concentrations of HCl**
2. **Very high heat-transfer rate**
3. **Light weight with adequate strength**
4. **Immune to thermal shock**
5. **Resistant to mechanical shock**
6. **Easy to machine and install**

For more details on the use of "Karbate" Impervious Graphite in producing anhydrous HCl, write to National Carbon Company, Inc., Dept. OG.

These products sold in Canada by Canadian National Carbon Company Ltd., Toronto 4, Canada

The term "Karbate" is a registered trade-mark of

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Unit of Union Carbide and Carbon Corporation

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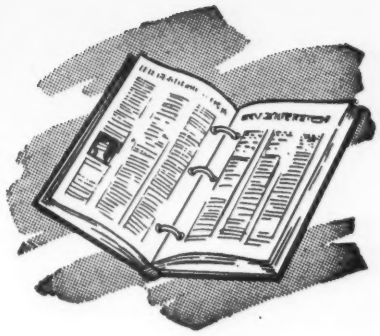
The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL



Retiring Thickness

10 and 18-In. Pipe

BASIS—GRADE A SEAMLESS STEEL PIPE (BUT A STRESS VALUE "S" OF 12,000 AT 750° F.)

$$t_m = \frac{PD}{2S} + C$$

t_m = minimum thickness, in.

P = internal minus external pressure, psia.

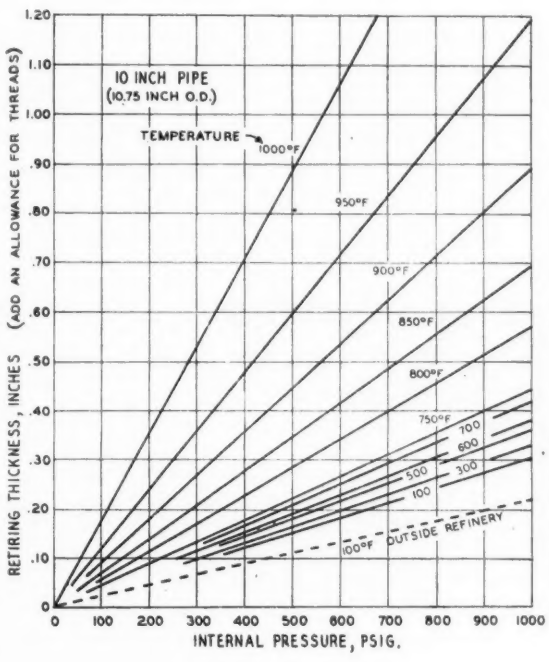
D = actual outside diameter, in.

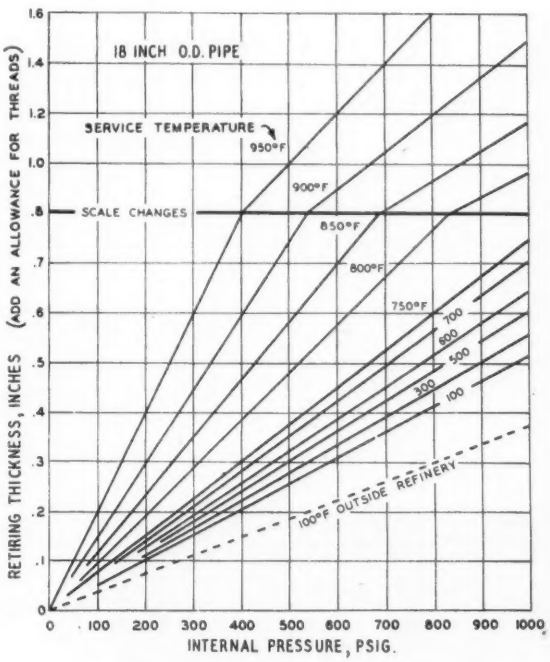
S = allowable metal stress, psi. (see tabulation of materials)

C = allowance for threading, welding, mechanical strength and/or corrosion

Values of C		Other materials	Specification	Multiplier for thickness
Welding	0.05	Grade A seamless	A.S.T.M.-106 A.P.I.-5L	1.0
		Grade B seamless	A.S.T.M.-106	.77
Pipe threads		Grade B seamless	A.P.I.-5L	.80
⅛-in.	0.03	Grade C seamless	A.S.T.M.-106, A.P.I.-5L	.64
¼-⅜-in.	0.044	Lap welded	A.S.T.M.-53, A.P.I.-5L	1.33
½-¾-in.	0.057	Butt welded	A.S.T.M.-53, A.P.I.-5L	1.60
½-in.	0.07			
2-in. up	0.10			

Refer to Refiner's Notebook No. 192 (Inspection), April 15, 1948, and a correction of Table 2 which appeared May 13, 1948, for a discussion of A.S.A. Code for Refinery and Gasoline Plant Piping, the effect of temperature, etc.





No. 203 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

How to make your dollars go further in stainless piping

Practical engineers show you the dollar-saving way to increase your alloy piping efficiency in "Corrosion Resistant Piping," a comprehensive discussion prepared by the Taylor Forge engineering staff and on the presses now.

This new, fact-filled bulletin discusses the fundamentals involved in minimizing the cost of stainless materials . . . points out the advantages of conforming to IPS outside diameters . . . discusses Schedules 5S, 10S, 40S, and 80S in relation to pressures and temperatures . . . gives you a new slant on flanged connections . . . offers a realistic approach that will prove helpful to you. The supply is limited, so write today to reserve your copy.

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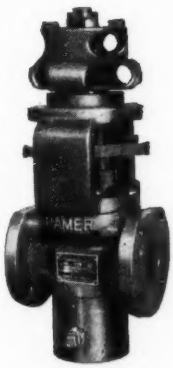
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

by John M. Spears

(1) STEAM-HEATED PLUG VALVE is for use on lines carrying asphalt, tar, and other services where heated valves are required. Heat is applied from a chamber on the lower part of the valve to which steam lines are attached. Heat is transferred through the body and the plug. Valve also has the exclusive plug adjusting nut feature incorporated in all manufacturer's valves. Plug adjusting nut, located under the plug head, when turned to the left acts as a screw jack to lift the plug slightly in the body, freeing it for easy turning. This feature assures that the valve may be opened or closed under all conditions and will not stick. Plug adjusting nut when turned to the right lowers the plug into its seat and holds it in correct adjustment for routine operation. *Hamer Oil Tool Co.*

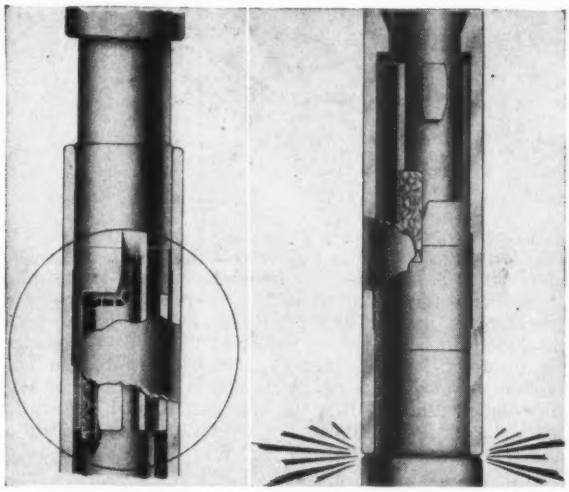


IT'S NEW CHECK IT

(2) WATER-FINDING PASTE for the petroleum and chemical industries is a golden brown color that turns red on contact with water level in tank bottoms. New paste is not effected by any petroleum products and makes it easier for the gagers to read in daylight or night, thereby assuring more accurate gaging. For the chemical industry it will gage either acid or alkaline water and many other chemical solutions. Paste is easily applied and sticks readily to gage stick, tape, or bob. *Kolor Kut Products Co.*

IT'S NEW CHECK IT

(3) BUMPER SAFETY JOINT incorporates both a bumper sub and safety joint in one unit. By using a new type of spring arrangement, tool is assembled with a preloaded spring compression that holds the bumper safety joint in an open position at all times and under all drilling conditions until it is desired to strike a downward blow. To operate the pumper safety joint a weight equivalent to approximately 2,000 ft. of drill pipe is lowered onto the tool. This weight actuates a tripping mechanism which automatically releases, allows the weight of the pipe to strike a heavy blow downward, and then automatically recocks itself after the blow has been struck. Blows can be struck repeatedly and continually as long as desired by simply raising and lowering the drill string. Also, the weight necessary to trip the tool can be varied, if desired, when assembling the tool. Joint is packed off to permit full and continuous high pressure circulation during drilling operations, and has adequate internal diameter to permit passage of wire-line equipment. *Shaffer Tool Works.*



As a safety joint *In bumper sub position*

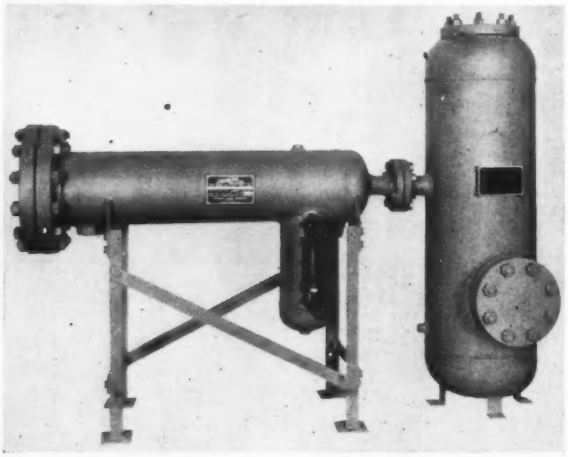
IT'S NEW CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

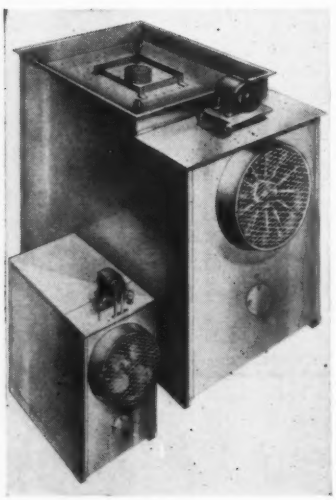
OIL AND GAS EQUIPMENT Digest — IT'S NEW CHECK IT

(4) NEW TWO-STAGE DEHYDRATOR completely dehydrates butane and propane; gasoline, natural gas lines, etc.; and instrument and air lines. First stage operates as a separator. The treated media near the inlet coalesces the tightest emulsions rapidly. A definite water gradient



at rated capacity allows precipitated moisture to fall to the bottom of separator before reaching the accumulator chamber. The second-stage dehydrator vessel is designed specifically for installations where reactivation of the dessicant is not practical. Inlet connection is extended internally to near the top center of the tank so that the liquid down-flow is evenly distributed to reduce any tendency for channeling. A standard 100-lb. bag of factory-sealed alumina fills the chamber to just below the inlet pipe thus eliminating any overfilling or underfilling and the necessity of broken packages. *Warner Lewis Co.*

IT'S NEW CHECK IT

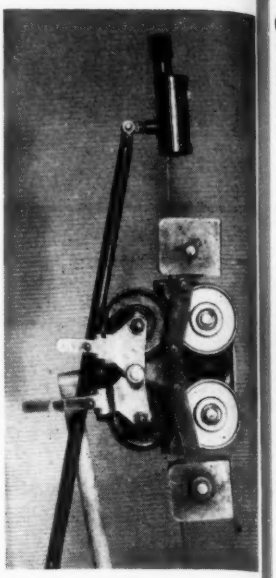


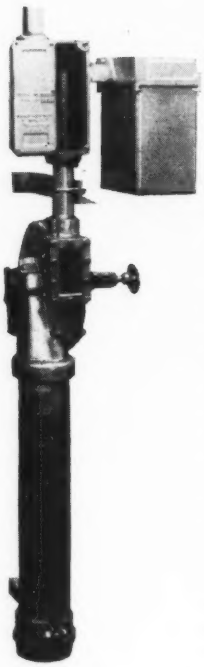
(5) NEW AQUA-TOWER answers the demand for a "packaged product" up to 50 tons of refrigeration. Unit is delivered completely assembled and requires no field erection. Unit has all-steel integral-weld casing with nailless redwood filling. Engineered for indoor or outdoor service. Aluminum fans—all-steel basins. Sturdy fan guard insures safe operation. Two general styles and seven sizes range from 3 to 50 tons of refrigeration. *Marley Co., Inc.*

IT'S NEW CHECK IT

(6) NEW WIRE-LINE WIPER cleans and oils line in one operation. Wiper lengthens the life of the line, minimizes corrosion, and increases measuring efficiency. Device spreads a uniform film of oil without messy splattering. It is easily attached to any size line and adaptable to any type mounting and measuring equipment. *McNaughton Tool & Instrument Co.*

IT'S NEW CHECK IT





(7) REMOTE-READING TANK GAGE is an automatic electric gage which gives accurate readings instantaneously. Illustration shows drive unit and transmitter with sight-reading gage equipment. The office indicator unit, which may be installed at any remote location from a tank battery, provides a separate dial for each tank equipped. The liquid level is continuously indicated, and can be read as easily as telling time by a clock. Dials are graduated in ⅛ inches and feet. Transmission system consists of a self-synchronous system made up of Selsyn motors. Complete unit is available, or the remote reading system may be attached to present Varec sight-reading gage equipment. *Roach Equipment Manufacturing Co.*

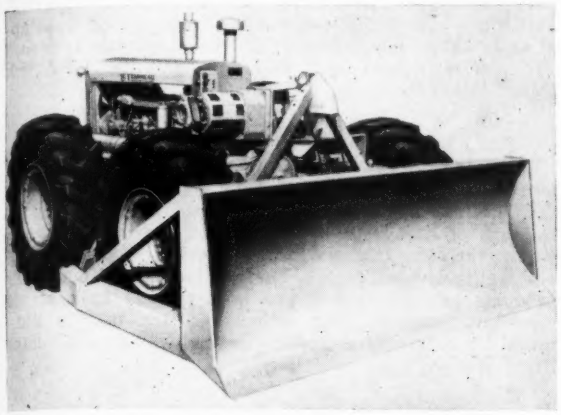
IT'S NEW CHECK IT

(8) NEW SWIVEL, for heavy duty hoisting around drilling rigs and marine work, is of heat-treated alloy steel with forged steel rings at each end that will take manila rope up to 2⅝-in. diameter. Grease-packed ball bearings

in each end prevent kinking and twisting of lines. Actual tests show this swivel to have a breaking strength in excess of 30 tons. The swivel weighs 8½ lb., is 11½ in. long. Can be furnished galvanized for marine use and in smaller sizes. *L-K Pump Valve Co.*

IT'S NEW CHECK IT

(9) NEW EARTHMOVER is a 25-ton pusher and bulldozer. Mounted on huge heavy-duty 24.00 by 29 ground-grip tires featuring tapered bead construction, the 300-hp. unit has a top speed of 13.6 m.p.h. both forward and reverse. This new high-speed machine is for dozer and pusher loading. Traveling speeds have been increased



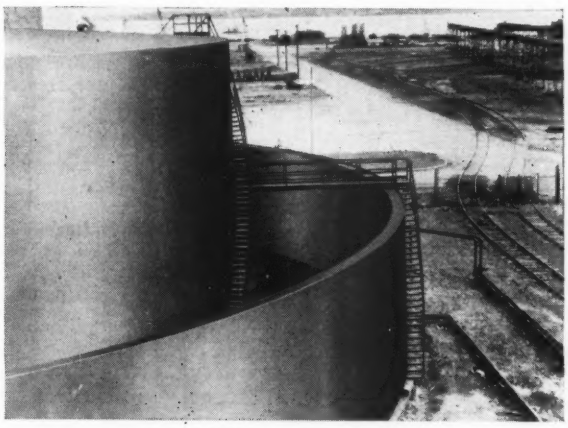
and are almost double those of the crawler tractor. New Tournamatic transmission eliminates shifting of gears. The instantaneous speed selection of any four forward or reverse speeds has been made possible by the constant-mesh principle in transmission design. Six multiple-disc clutches select the desired ratio secured by one gear-selection lever. Steering clutches, brakes, and transmission clutches are all air actuated. Tractor dozer has new electrically operated blade control. This control is a 240 volt, 120 cycle a.c. Tournatorque electric motor working through a gear reduction box. The motor brake, an integral part of the motor assembly, locks the blade in the desired position upon the release of the blade control switch. *R. G. Le Tourneau, Inc.*

IT'S NEW CHECK IT

(10) STAINLESS STEEL ANEROID MANOMETER measures and controls flow, liquid level, or specific gravity of those applications which involve caustics or difficult acids such as sulphuric, acetic, nitric, and phosphoric. The housing and all internal parts coming in contact with corrosive mediums are made of type 316 stainless steel. Because corrosive fluids can be introduced directly into the manometer, no sealing fluids or purges are necessary. Balancing agent is a torque tube to eliminate any need for liquid. Elimination of mercury prevents product contamination from this source and constitutes a definite process economy. Maintenance is cut to a minimum because there is no mercury to replace; no stuffing box, no internal parts to wear out. It is easy to clean because all areas are readily accessible. Available in ranges of 20, 50, 100, and 200 in. of water differential with a body of pressure rating of 300 psi. *Taylor Instrument Companies.*

IT'S NEW CHECK IT

(11) STEEL DIKES protect adjoining tanks and property for above ground storage facilities of fuel oils and other petroleum products in high-cost, built-up portions of metropolitan areas. Steel dikes consist of cylindrical steel shells attached to ring foundations of concrete of sufficient depth to prevent escape of liquid underneath



the steel shell. Moat formed by shell has capacity equal to or greater than that of the closed tank which is used to store the petroleum product. In many cases the steel bottom of the storage tank is extended outward and the shell is attached to it, thereby eliminating concrete foundation. Top of steel dike wall is stiffened with an inside wind girder which also serves as a deflector which reduces the possibility of "boil over" wave. *Hammond Iron Works.*

IT'S NEW CHECK IT

(12) ALUMALUM SAFETY PLATES are new anti-slip treads that provide positive protection on all types of walkways under any conditions—wet, mud, or ice-covered. The lightweight plates are of cast aluminum, with a crust coating of ⅛-in. aluminum oxide grains cast integrally on the wear surface. Sizes are 11 by 36 in. and 23 by 35 in.; both are ⅜ in. thick. Counter-sunk ¼-in. mounting holes on rims. All edges are beveled. These anti-slip treads for drilling rigs, oil-field installations, gasoline plants, refineries, and pipe-line pumping stations are designed to provide permanent safety steps. No wear, no painting, no maintenance. *American Abrasive Metals Co.*

IT'S NEW CHECK IT

TRADE LITERATURE

(13) CONVERSION TABLES. Convenient wall card gives easy-to-read conversion tables for many applications. Among the many tables listed are Centigrade-Fahren-

heit temperature conversion tables, hydrometer conversion table for liquids heavier than water, and hydrometer conversion table for liquids lighter than water. *Refinery Supply Co.*

IT'S NEW ✓ CHECK IT

(14) PETROLEUM USES OF CRANES AND SHOVELS. A 16-page illustrated booklet, describing the varied uses of power cranes and shovels in the petroleum field, explains the widespread applications of the equipment to petroleum problems "from production to refinery." Contains scores of on-the-job illustrations. *Thew Shovel Co.*

IT'S NEW ✓ CHECK IT

(15) AIR & VACUUM OPERATED SHOVELS, described in new catalog data sheets, provide positive temperature control for many types of oil-field machinery, equipped either with or without air. Cross-section diagrams of the operating controls are given. *Kysor Heater Co.*

IT'S NEW ✓ CHECK IT

(16) RADIATION SURVEY INSTRUMENT. Bulletin describes a completely portable, battery operated instrument for the measurement of radiation intensities. Direct reading; detects and measures both beta and gamma radiation; small, compact, light weight. Various models. *El-Tronics, Inc.*

IT'S NEW ✓ CHECK IT

(17) WIRE-ROPE SLINGS. Material covers manufacturer's wire-rope slings in most common use, including the erector or choker sling which is exceptionally popular because of its versatility and economy. Price schedules included. *Industrial Splicing Co.*

IT'S NEW ✓ CHECK IT

(18) RIG & PUMP DRIVE GROUP, made up of multiple engines, is described in new seven-page, two-color catalog. Material emphasizes unit's particular adaptability for off-shore drilling. A special insert describes manufacturer's semi-electric offshore drilling rig. *Mid-Continent Supply Co.*

IT'S NEW ✓ CHECK IT

(19) PROTECTIVE COATING SYSTEMS, for corrosion control in the petroleum industry are described in new bulletin adaptable for ring binding. Coating is for use on metal, concrete, and wood and is applied by brushing, spraying, or dipping. *United Chromium, Inc.*

IT'S NEW ✓ CHECK IT

(20) TRUCK ENGINEERING FOR THE OIL INDUSTRY. New eight-page bulletin describes the many oil-field applications for manufacturer's trucks. Emphasis is placed on capacity, adaptability, and dependability. *Kenworth Motor Truck Corp.*

IT'S NEW ✓ CHECK IT

(21) VALVES AND FITTINGS for the marketing of petroleum products are described and illustrated in new 48-page catalog. Information also describes complete sets of loading-arm assemblies for the loading of petroleum products into truck cars and tank cars at bulk plants, pipe-line terminals, and refineries. Each unit is illustrated by blue-print-type descriptive drawings. *Wheaton Brass Works.*

IT'S NEW ✓ CHECK IT

(22) OIL-BURNING EQUIPMENT. Two new bulletins describe the Type "A" and Type "H" oil burners with the mechanical atomizing feature, and combination gas and oil burners. Both bulletins carry cross-section blueprint drawings of both types of burners and atomizers. *Peabody Engineering Corp.*

IT'S NEW ✓ CHECK IT

(23) NEW LINER PULLER. Descriptive pamphlet describes new liner puller weighing only 10 lb. Puller eliminates the necessity of tearing down a mud pump before removing the liners. Illustrated. *Stout - Owen Liner Puller.*

IT'S NEW ✓ CHECK IT

(24) DRY-CHEMICAL FIRE EXTINGUISHERS. Charts showing the characteristics of approved hand fire extinguishers and the comparative effectiveness of approved extinguishers on flammable liquid fire are features of new catalog. Included is a pictorial explanation of the action that takes place when the dry chemical comes in contact with flame. *Ansul Chemical Co.*

IT'S NEW ✓ CHECK IT

(25) AUTOMATIC CONTROL EQUIPMENT. New two-color bulletin adaptable for ring binding describes and illustrates transfer switches, remote control switches, automatic time switches, magnetic contactors, interval timers, process timers, program clocks, and reversing starters. List prices included. *Zenith Electric Co.*

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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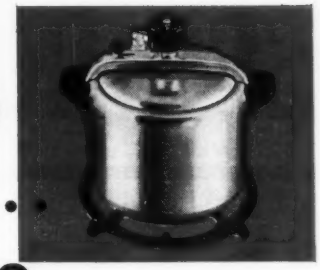
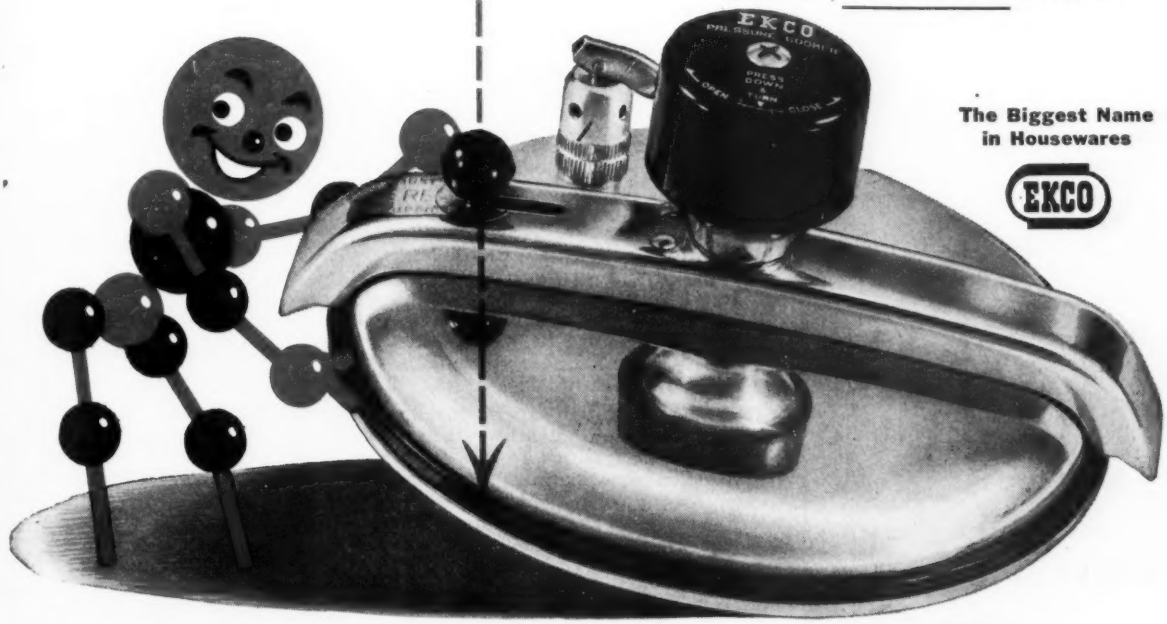
When "the heat's on"... pressure, too, this PERBUNAN gasket can take it!



When deciding on a material for the gasket of their famous pressure cooker, the Ekco Products Company chose a *Perbunan* composition because it:

1. *Does not swell, soften or lose its shape under pressure at 250° F. even when exposed to most vegetable and animal fats and oils.*
2. *Does not harden or become brittle in use or when exposed to air.*
3. *Has no taste or odor, even when boiled in water for long periods of time; not harmed by washing in hot, soapy water.*
4. *Has good physical properties such as: (a) high tear resistance, (b) good tensile strength, (c) good elongation.*
5. *Materially reduced the manufacturing cost of the* EKCO *Pressure Cooker.*



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EKCO

Other manufacturers are finding new uses for versatile *Perbunan* every day. They like its toughness and the way it stands up under severe heat, cold and a wide variety of oils, acids, and greases . . . and they like its ready adaptability to the many complex molded shapes of resilient engineering materials.

NEW FEATURE: *Perbunan's* new stabilizer permits the use of a wide variety of delicate shades that retain their original color.

Maybe there's a place in your business where the use of versatile *Perbunan* in a plastics or rubber part may save you plenty . . . both in initial cost and replacements. We will be glad to give you all the information you need.

ENJAY COMPANY, INC., 15 West 51st Street, New York 19, N.Y.

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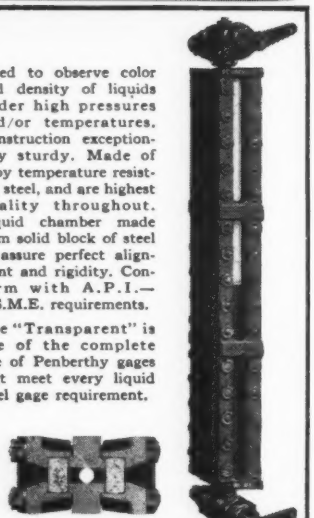
THE RUBBER THAT RESISTS AIR, WATER, HEAT, COLD AND TIME

PENBERTHY
"TRANSPARENT"
DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Transparent" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.



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DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

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FUL-KONTROL
ELECTRICALLY HEATED
PENSKY-MARTENS
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7 ADVANTAGES

1. Will test all products whose Pensky-Martens Flash and Fire points fall within A. S. T. M. D-93 specified limits.
2. Flash burners fed from vertical gas riser with needle valve control at top—no loose hanging rubber tubes to get in way.
3. Metal collar fastened to gas riser, holds mechanism head when it is removed from test cup.
4. Proper rate of heating rise is assured by Ful Kontrol Heater. Built-in auto-transformer (not rheostat) gives virtually stepless control to 750 watts maximum.
5. Long life heating elements are nickel chromium, retained in porcelain refractory, with Monel metal terminals. Complete heaters or elements only, easily replaceable at low cost.
6. Heavy cast iron support base. Heater has stainless steel case. Rigid nickel plated columns support the Pensky-Martens mechanism.
7. An efficient, serviceable, Slo-Speed motor, with complete mounting can be supplied to eliminate tedious hand stirring.

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REFINING

Second Coal Gasification Experiment Is Planned

APPROVAL of a contract between the U. S. Bureau of Mines and Alabama Power Co. for a second and larger cooperative experiment in underground coal gasification at Gorgas, Ala., was recently announced. A joint experiment last summer showed that gases produced by burning unmined coal offer a potential source of fuel for power and raw materials for synthetic liquid fuels.

Cost of the large-scale field test is estimated at $411,000 for a 1-year period. Under the contract, the company will provide engineering and operating services on an actual cost basis and will provide a site for the experiment of about 300 acres of Pratt seam coal averaging 40 in. in thickness.

Preliminary core drilling is already in progress to determine the composition of the ground overlying the coal, which ranges from 60 to 125 ft. in depth. Later five large diameter holes will be drilled to the coal bed and the driving of two parallel entries, 1,200 ft. from the coal outcrop into the bed and a single butt entry for an additional 300 ft. It is expected that site-preparation work will be completed by next fall.

Objectives of the experiment are to determine the quantity of coal which can be gasified from a given combustion zone and the shape and extent of the burned out area; to determine whether fixed outlets for product gas are practicable, either at the outcrop of the coal bed or at vertical bore holes; to determine the quality and quantity of product gas generated with an air blast under experimental conditions, and the quantity of tar and related products obtained; and to obtain fundamental technical and economic information concerning plant sites, installations, and operating processes.

Results from last year's experiment showed that combustion could be maintained and controlled, that coal in place could be gasified completely, and that the roof rock would become plastic, expand, and settle down behind the burning coal face without cutting off the air or gas. However, the gas obtained was of lower heating value than desired. This was attributed to leakage of gas and air pressure through cracks and breaks in the thin 30-ft. cover over the burning coal seam.

The new experiment will be carried out at 100 ft. or more and with heavier air pressures and higher temperatures to correct this condition. These factors are expected to increase the the average heat value of the gas produced with an air blast from the 47 B.t.u. per cubic foot obtained last year to from 70 to 125 B.t.u. Oxygen and steam will improve the gas quality further.

M.F.A. Purchases Delta Refinery at Memphis

The Missouri Farmers Association, Columbia, Mo., a cooperative group, has purchased the 4,000 bbl. per day Delta Refining Co. refinery at Memphis, Tenn., from Trumbull Asphalt Co., Chicago. Sold with the plant was the Southern Petroleum Co., sales agency for the company. Its operations are expected to be discontinued.

Output of the plant will be used to supply petroleum products needs of M.F.A. members. M.F.A. also owns a 1,800-bbl. refinery at Chanute, Kans.

Monsanto Announces New Detergent, Santolube 222

A new chemical, Santolube 222, an effective detergent in lubricating oils and containing magnesium in the chemically combined state, has been announced by Monsanto Chemical Co. Santolube 222 is said to show lower ash content and greater detergent dispersant properties than several other detergents containing heavier metals than the magnesium base of the new product.

Monsanto's research and testing organization for petroleum chemicals was consolidated recently in new engine and chemical laboratories nearby the main office in St. Louis.

Shell Completes New Deer Park Control Lab

HOUSTON.—Shell Oil Co., Inc., announced last week that construction had been completed on a new $1,000,000 control laboratory at its Deer Park refinery near here.

The project was a part of the Deer Park expansion program which includes a $33,000,000 lubricating-oil plant and the $50,000,000 construction

at the adjacent Shell Chemical Corp. plant, all units of which are nearing completion.

The control laboratory will provide about 23,000 sq. ft. of floor space and will include a separate knock-testing laboratory and adequate spacing for pilot-plants and future expansion. Design was by Austin Co., and construction by Knutson Construction Co., Houston. The laboratory will aid in increasing process efficiency and product quality, and will serve to facilitate control of refinery operations.

Humble, Stanolind, Shell Set Up O. U. Fellowships

Humble Oil & Refining Co., Stanolind Oil & Gas Co., and Shell Union Oil Corp. and its associated companies have established fellowships in petroleum engineering at the University of Oklahoma.

The Humble fellowship, carrying a stipend of $1,250 per academic year, is open to candidates for the masters degree in petroleum engineering. The Stanolind fellowship, carrying the same stipend, and open to candidates for the same degree will include graduate research study in the field of displacement of oil from reservoir material. The Shell fellowship, with a stipend of $1,200 per year, plus an additional $300 per year for purchase of equipment, is open to candidates for the masters degree in petroleum engineering.

Applications are invited from men with bachelor's degrees in petroleum engineering or a related field from an accredited school. All applications should be received not later than July 10.

New Petroleum Derivative To Be Used for Tanning

Manufacture of commercial quantities of a new synthetic material derived from petroleum hydrocarbons and used for the preparation and tanning of leathers, has been announced by the chemical department of E. I. du Pont de Nemours & Co., Inc. The new product is made by treating aliphatic hydrocarbons with sulfur dioxide and chlorine to form sulfonyl chlorides.

The new product is said to be able to compete with quebracho on a weight-to-weight comparison, and to be competitive with oil and chrome tanning agents.

Further research of this reagent to the tanning of shoe leather is being carried out by the organic chemicals department in collaboration with commercial tannery concerns.

Ten Reports Feature Research Conference

Ten reports to be given by men in the petroleum research field will highlight the Petroleum Research Conference, a phase of the Gordon Research Conferences, to be held at Colby Junior College, New London, N. H., June 28-July 2.

The purpose of the program, which includes lectures and discussions on subjects of a scientific and technical nature, is to bring experts up to date as to the latest developments and to bring out suggestions as to underlying theories and profitable methods of approach for making new progress.

Reports to be presented at the 5-day Petroleum conference include the following: "Radioactive Tracer Techniques," and "Naturally Occurring Radiocarbon," W. F. Libby, University of Chicago; "The Study of Certain Reaction Mechanisms by Use of Radioactive Carbon," Melvin Calvin, University of California; "The Mechanisms of Catalytic and Thermal Cracking Reactions," B. S. Greensfelder, Shell Development Co.; "The Mechanism of the Alkylation of Saturated Hydrocarbons," Louis Schmerling, Universal Oil Products Co.

"Polar Intermediates in Hydrocarbon Reactions," Charles C. Price, Notre Dame University; "Hydrogen Bromide Catalysis of Oxidations of Hydrocarbons," F. F. Rust and W. E. Vaghan, Shell Development Co.; "Solubilization," J. W. McBain, Stanford University; "Monodispersed Colloids and Higher Order Tyndall Spectra," Victor K. LaMer, Columbia University; and "Microwave Absorption—Interpretation and Utilization," Sidney Golden, Hydrocarbon Research, Inc.

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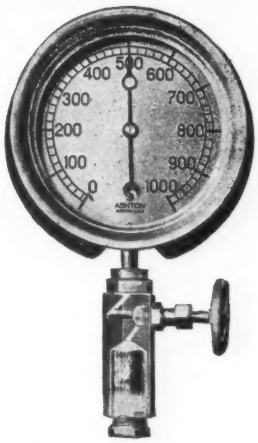

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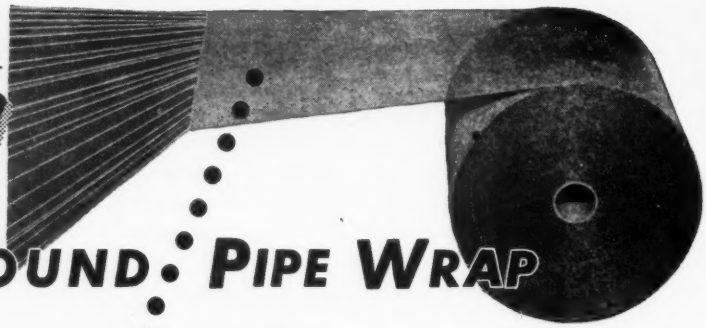

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When Vitron Underground Pipe Wrap is applied with conventional coating and wrapping machines, the hot coating permeates and saturates the glass fiber mat. The glass fiber then becomes an integral part of the coating thus reinforcing it uniformly throughout the surface of the pipe.

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7. Light in weight—easy to handle and apply
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★ Vitron is the trade name of glass fiber underground pipe wrap manufactured by Glass Fibers, Inc., Waterville, Ohio, and sold all over the world by M. J. CROSE Manufacturing Co., Inc.

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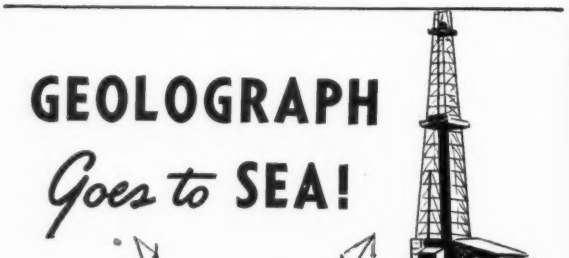

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PIPE LINES

Texas Gas Seeks FPC Approval for New Line

TEXAS GAS TRANSMISSION CORP. last week requested authority from the Federal Power Commission to construct 840 miles of pipe line from Texas to Ohio to deliver additional natural gas to its existing Memphis and Kentucky divisions and to other utility companies serving areas of Kentucky, Ohio, and Pennsylvania.

Proposed facilities include 114 miles of 20-in. line and 726 miles of 26-in. line from Carthage gas field, Panola County, Texas, to Texas Eastern Transmission Corp.'s Compressor Station No. 16 near Middletown, Ohio; 32 miles of 12-in. loop line from the 26-in. line at Madisonville, Ky., to the existing pipe lines of the Kentucky division near Evansville, Ind.; and 10 new compressor stations having combined capacity of 68,800 hp. Construction cost has been estimated at $73,500,000.

Construction of the 26-in. line will begin within 60 days after FPC approval, the company stated in its application. First deliveries of gas at the eastern terminus of the line can be started in December 1949 and full contract quantities can be delivered by the spring of 1950. Four contracts have been signed with 41 producers to supply Texas Gas with its natural-gas requirements.

The company has purchased and received delivery of 33 miles of 26-in. pipe, and according to present delivery schedules, expects to have 253 miles of 26-in. pipe on hand by October. Deliveries have started on $221,300 worth of valves for the new line, and $211,250 of pipe wrappings.

Texas Gas estimates that by 1951 the new line will make peak-day deliveries of 391,600,000 cu. ft. per day and its pipe-line system will reach peak-day sales of 660,400,000 cu. ft. daily.

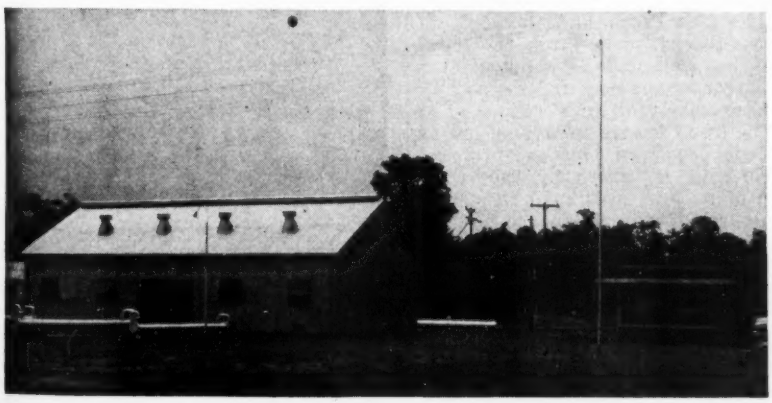
Stone & Webster Engineering Corp. has signed a contract to supervise construction of the pipe line and compressor stations.

Gas transported through the new line will be delivered to the Memphis and Kentucky divisions of Texas Gas, to Louisville, to Ohio Fuel Gas Co., Manufacturers Light & Heat Co., East Ohio Gas Co., and Texas Eastern Transmission Corp.

Work Is Progressing on Two Socony-Vacuum Lines

Socony-Vacuum Oil Co., Inc., had laid approximately 3 miles of pipe early last week in starting construction at the southern end of the Malvern, Pa.-Binghamton, N. Y., 156-mile 8-in. products pipe line. This project will connect two existing Socony-Vacuum products systems including the one extending from Paulsboro, N. J., to Malvern and the system extending from Buffalo along the Erie Canal and south to Binghamton.

Delivery terminals on the Malvern-Binghamton project will be located in



Mid-Continent Pipe Line Co.'s new Bad Creek pump station near Pharoah, Okla., which replaces an old station. The new unit has two 25,000-bbl. reciprocating pumps. It handles crude oil from Garvin and Stevens counties, in southern Oklahoma, destined for the Mid-Continent refinery at Tulsa. The station is equipped with electric tank-gaging facilities. The engines are gas-operated, and fire walls isolate the pumping units

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Operations of the contractor, Midwestern Constructors, Inc., are headquartered at Pottstown, Pa. A plant for applying somestic coating is operating at Stowe Quarry near Pottstown.

For the construction of Socony-Vacuum's 124-mile 6-in., Portland-Bangor, Me., products line, the contractor, Associated Contractors & Engineers, were moving in equipment in order to start pipe laying at the end of last week near Bangor. Terminals will be built at Hallowell, Auburn and Bangor, Me. Two Worthington variable-stroke pumps have been ordered for the Portland station. George Brigance, general superintendent, is directing both the Malvern-Bingham-ton and the Portland-Bangor projects.

Huge Pipe-Line Growth Is Predicted by Hyde

Pipe-line construction, now proceeding at a rate limited only by the availability of steel pipe, will add 29,000 miles to the world's pipe-line facilities by the end of 1951, Dr. M. A. Hyde, engineer with Westinghouse Electric Corp., told the American Institute of Electrical Engineers June 21 at their summer general meeting held in Mexico City.

Most of the construction is in the United States, Hyde said, with natural-gas lines accounting for 10,900 miles, crude oil 7,600 miles, and products, 5,300 miles. Total miles of new construction outside the United States, he said, is 5,200 miles.

A trend toward increasing use of electric energy is being established in modifying existing lines to meet post-war conditions, the Westinghouse engineer said. He pointed to the Big Inch system as an example, which carried crude oil and products during the war but which now are carrying natural gas from Texas fields to the New York and Philadelphia areas. Electric motors from the 20-in. line, he said, will be supplemented by larger motors now under construction, to drive centrifugal compressors.

The trend toward increasing use of electric power on pipe-line projects, Hyde said, is caused by "appreciation of its low investment in station equipment, low maintenance and attendance costs, reliability, and effectiveness of control."

Pipe Corrosion Specimens On Display in Washington

Eighty-five varieties of pipe materials, which were exposed at 15 test sites throughout the United States for periods ranging from 5 to 14 years, will be on display until August 15 in the National Bureau of Standards'

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OIL PIPELINES GAS PIPELINES GASOLINE PIPELINES WATER PIPELINES
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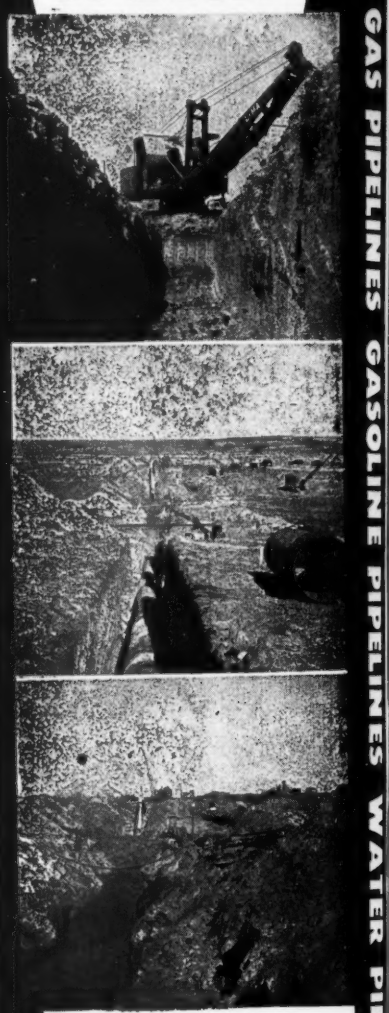

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underground corrosion laboratory in Washington. Approximately 3,000 test specimens will be exhibited.

The materials include 7 types of wrought iron and wrought alloys, 17 types of cast iron and cast alloys, 22 types of steel and steel alloys, 13 types of copper and copper alloys, and miscellaneous samples of lead, zinc, metallic and nonmetallic coated pipe, and asbestos-cement pipe.

Measurements of loss of weight and depth of pitting of the specimens have been made, and a report on the corrosion resistance shown by the materials studied is in preparation.

Work to Begin in Fall On Buckeye's Ohio Line

Buckeye Pipe Line Co. will start construction in the fall on a 22-in. crude-oil line from Lima to Toledo, Ohio, which will be 83 to 85 miles in length. The line will follow generally the route of existing Buckeye lines.

Construction began recently for Buckeye's Cygent-Cleveland, Ohio, crude-oil line contracted by Sheehan Pipe Line Construction Co. Sohio Pipe Line Co. withdrew from participation in this project which was previously announced as a Buckeye Sohio undertaking. Buckeye will utilize existing diesel reciprocative pumping units at the Cygent station.

Pipe-Line Revenue for 1948 Up 16 Per Cent

The combined pipe-line revenues of the 44 crude-oil and products pipe lines reporting to Interstate Commerce Commission totaled $79,760,957 for the first quarter of 1948, an increase of 16 per cent over the same period a year ago.

This revenue was gained from carrying 601,065,077 bbl. of oil, which was 78,347,917 bbl. more than in the first 3 months of last year. Of the 44 companies only 9 reported declines during the first quarter. The largest revenue reported was $8,995,255 by Humble Pipe Line Co.

The reporting companies include those with an annual operating revenue of more than $500,000.

Work to Begin Soon on Leduc-East Edmonton Line

EDMONTON, Alta. — Imperial Oil, Ltd., will begin construction this month to link Leduc field directly with its new refinery at East Edmonton. The present pipe line terminates at Nisku. Plans are to lay an 8-in. line north to Ellerslie and northeast to the refinery site.

PENBERTHY

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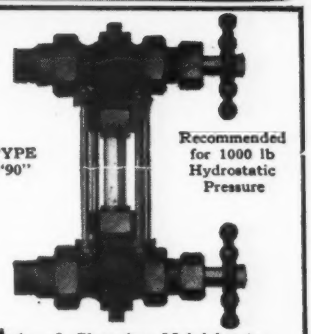

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Among the

Drilling Contractors

New A.A.O.D.C. Chapter Formed at Wichita Falls

Another local chapter of the American Association of Oilwell Drilling Contractors has been formed at Wichita Falls, Tex., with E. B. Clark, of the drilling firm bearing his name, as chairman.

Clay Underwood, Underwood Drilling Co., Inc., was elected vice chairman, and Dee Ford of Moran Brothers, Inc., was selected secretary of the group.

At the organizational meeting, brief talks were made by Howard Holmes, Two States Drilling Co. and a former association president; E. C. Brown, association president; George W. Dimock, president of the North Texas Oil and Gas Association; Fred Sehmann, executive secretary of this group; and Brad Mills and J. Doyle Settle of A.A.O.D.C.

Kansas Drilling Firm Organized at Hoisington

Flournoy & Williams Drilling Co. with headquarters at Hoisington, Kans., has been formed by C. D. Flournoy and Chester Williams.

Flournoy is president of Flournoy Drilling Co. which operates drilling-in units. Williams was formerly connected with the Lewis Drilling Co. of Wichita. Initial equipment of the new concern will be a string of rotary tools.

Pabco Drilling Co. Head Enters New Partnership

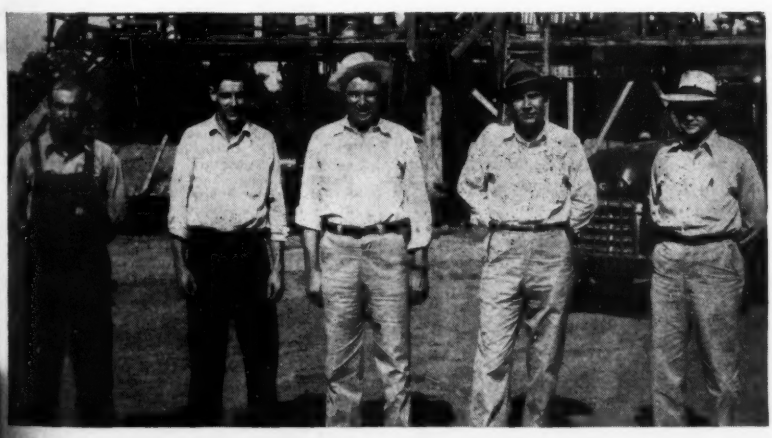
Penguin Petroleum, Inc., has been organized in Wichita by W. G. Talbot, Jack Brown, and Paul White. Talbot has disposed of his interest in the Pabco Drilling Co. of which he was formerly president.

The new company has purchased a 4,000-ft. rotary to engage in drilling activities for its own account. First job for the rig will be on Hawks lease in 27-28-3e, Salter pool, Butler County, Kansas.

Talbot is president of Penguin, Brown is treasurer, and White secretary.

Big Chief Drilling Co., Oklahoma City, has been awarded contract for Humble Oil & Refining Co. 1 Miner, a Travis Peak sand wildcat in Hart Survey, northeast of Fosterville, northern Anderson County, Texas.

Adkins Drilling Co., Great Bend, Kans., has rigged up rotary for a wildcat in Lincoln County, West Central Nebraska. Test is Texon Royalty Co. 1 Fletcher, NE NE SE 2-9-32, near the town of Dickens.



Crew of Roy Duffey Drilling Co., Dallas, on location at 2 Cox & Hammond Elliott, Velma pool, Stephens County, Oklahoma. The men are Jack Hoag; J. W. Ryan; W. J. Magers; T. A. Powell, driller, and Ivy Coady, tool pusher

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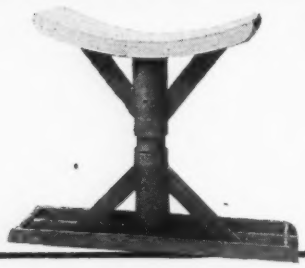

You save during setting-up time when Owen Boiler Jacks are used because only one man is required to level boilers. Owen Jacks are composed of only three pieces . . . base, cradle and screw . . . and a bar is the only tool required to raise or lower the jack. Hand grips simplify handling and coarse threads on the screw lift heavy loads with a minimum of effort.

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RUNNING High

Prince Drilling Co., Inc., Houston

W. G. PRINCE

Growth.—Prince Drilling Co., Commerce Building, Houston, has engaged in straight contract drilling on the Louisiana and Texas Gulf Coast since it was organized about 4½ years ago. The original partnership of W. G. Prince and his brother, J. M. Prince, subsequently was incorporated, and W. G. Prince is now president and J. M. Prince, vice president. Both brothers are veteran drilling and production men in the Gulf Coast area. They entered the oil business with the old Yount-Lee Oil Co. in the early 20s and were with Stanolind Oil & Gas Co. after it absorbed Yount-Lee. J. M. Prince continued with Stanolind until the drilling company was organized; W. G. Prince was associated with W. R. Davis from 1937 to 1941.

Operations.—From one rig initially the company has gradually expanded until it now operates three steam and one power rig. Most of the wells it has drilled have been 8,000 ft. and below. The company has not engaged in any drilling operations for its own account.

At present the rigs are operating as follows: steam rig drilling semi-wildcat near Clinton field, Harris County, for Stanolind Oil & Gas Co., a projected 10,500-ft. hole; steam rig now about 6,500 ft. on a well for Gulf Oil Corp., in Hankamer field, Liberty County; steam rig, nearing completion on a 10,500-ft. well for Stanolind in Moss Lake field, Calcasieu Parish; and power rig, spudding for a deep test of perhaps 14,000 ft. for Gulf in Little Chenier field, Cameron Parish.

Personnel.—H. J. Chavanne is secretary-treasurer. Toolpushers are L. S. Arrendell and E. W. Mouser, both of Lake Charles; S. B. DeMoss, Liberty, Tex.; and N. Smith, Devers, Tex.

Penrod Drilling Co., Shreveport, has contract for a 11,000-ft. or Smackover lime test for Hunt Oil Co. in Claiborne Parish, North Louisiana. Test is 1 Goodwin et al, SW SW 21-23n-7w, on southwest flank of the shallow East Haynesville field.

Tiger Tooth TONG DIES

Web Wilson "TIGER TOOTH" Tong Dies have a pyramidal, pointed tooth pattern that assures a positive, "biting" grip on the hardest tool-joints under the strongest pulls. Especially recommended for flame-hardened and hard metal surfaced tool joints or wear subs. The sloping sides and heavy base of the pyramidal shaped teeth gives extra strength and backing to each tooth. Tiger Tooth Tong Dies will not easily break down even in severe service. They are of the "full-length" design that completely fills die slot in the tong and are reversible to provide extra service life. . . "TIGER TOOTH" Tong Dies will fit all tongs used in the oil fields today—for dependable, economical service, specify WEB WILSON "TIGER TOOTH" TONG DIES.

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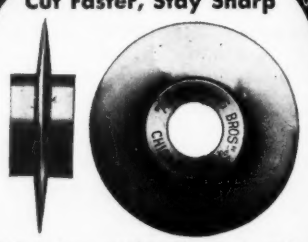

Machined from special alloy tool steel, oil tempered and hardened, ARMSTRONG BROS. Knife Blade Cutter Wheels, penetrate pipe easily, cut smoothly and rapidly, and hold their keen edge. They come in sizes and types for all makes of pipe cutters, and are stocked by leading tool departments everywhere.

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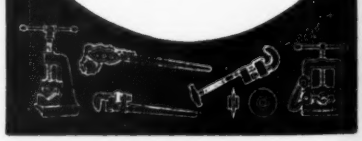
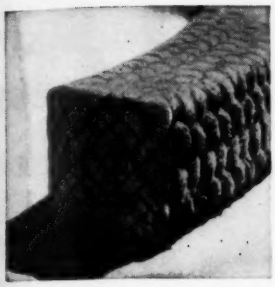
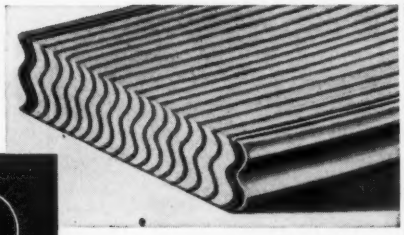




Upper left: GARLOCK Lattice-Braid Packing

Upper right: GARLOCK Chevron* Packing



GP

Lower: GARLOCK Guardian* Gasket (Cross section view)

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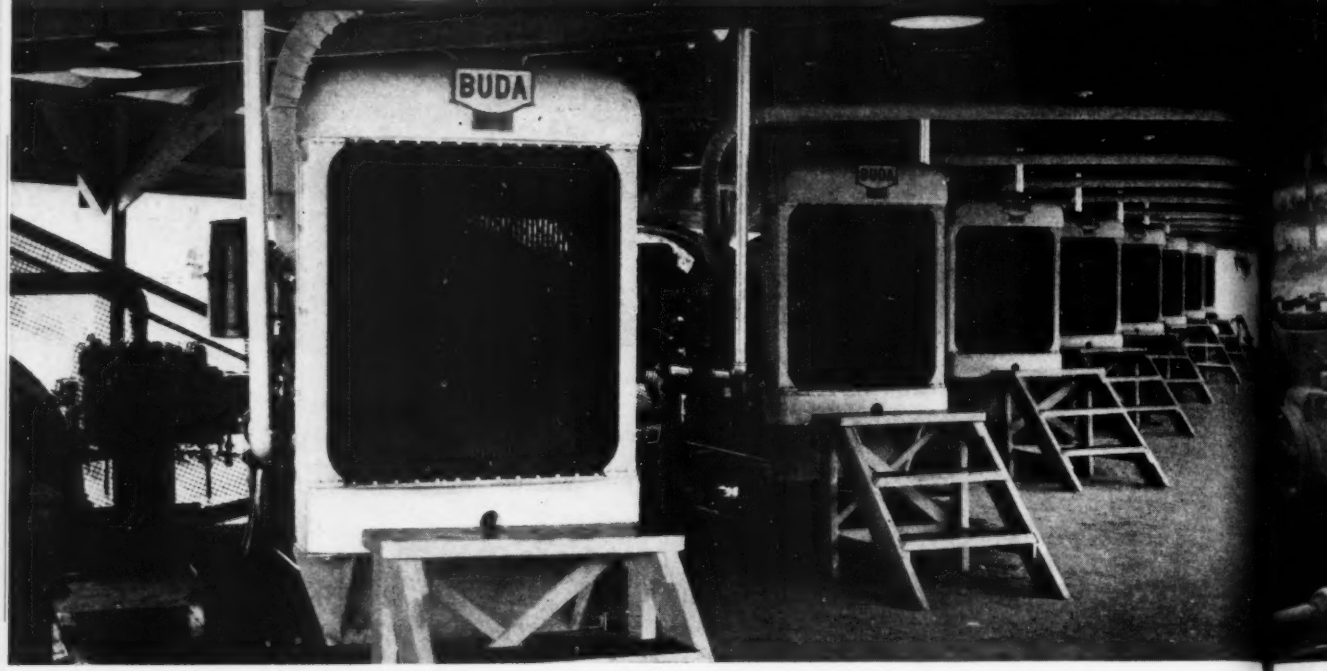

401 ENGINES — 20,796 *usable* h.p.— is a lot of power in anybody's language! Yet this is the number of Buda oil field engines installed on original and repeat orders during the past 9 years by just *one* major pipeline company for gathering and pumping oil. Today all of these 401 Budas — from the oldest HP-217's at the field gathering batteries, to the husky 1879's in the main line stations — continue to deliver the kind of efficient, low-cost performance, which experienced oil men have come to expect from Buda engines.

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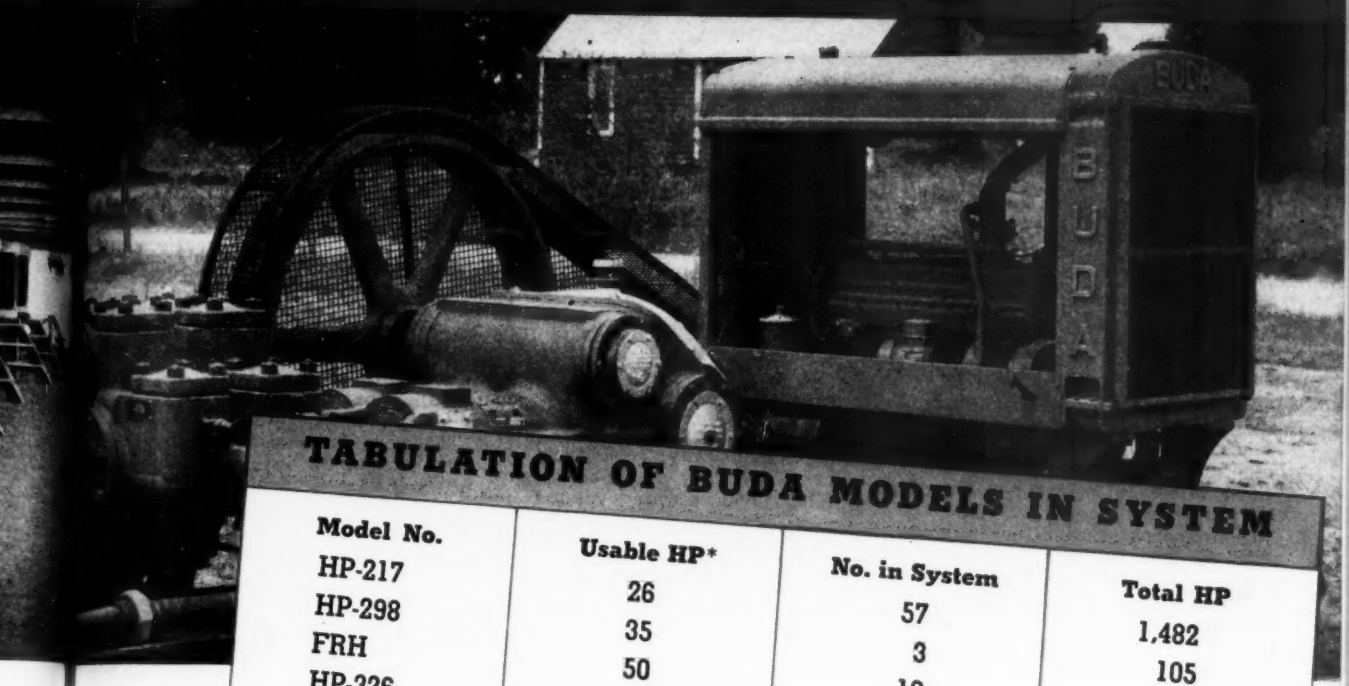

TABULATION OF BUDA MODELS IN SYSTEM

Model No.	Usable HP*	No. in System	Total HP
HP-217	26	57	1,482
HP-298	35	3	105
FRH	50	19	950
HP-326	40	147	5,880
K-428	52	119	6,188
L-525	60	5	300
M-766	90	10	900
JL-877	75	5	375
MO-893	107	17	1,819
6DH-909	110	2	220
6DC-1879+	150	1	150
PCD-1879+	150	3	450
PHD-1879+	150	4	600
PC-1879	153	9	1,377
		401	20,796 HP

* for pipeline pumping
\+ Diesels operating on crude oil

BUDA

Oil Field ENGINES
Butane • Natural Gas
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. . . A POWER-FULL NAME IN ENGINES

NATURAL GAS

Western Gas No Threat To Eastern Purchasers

THE introduction of so-called "cheap" gas from the Southwest is not a threat to the Appalachian producer so long as competitive conditions exist, Oliver W. Van Petten of Columbian Fuel Co., Charleston, W. Va., declared in an address before the annual convention of the Kentucky Oil and Gas Association in Lexington, Ky., last week.

"The declining gas supplies of the Appalachian area are necessarily being supplemented by increasing quantities transmitted by pipe lines from areas in which new reserves are being discovered at a rate equivalent to or greater than the rate of consumption, and such projects will have a beneficial effect in assuring continuity of supply with consequent benefits to consumers and utilization in industry," he said.

Explaining that some Appalachian producers view with serious concern the problems which result from bringing into the area "cheap gas from the Southwest," Van Petten said:

"It might be well to examine the factors entering into bringing in the so-called 'cheap gas' to see whether it really is 'cheap gas.' The producer must determine the factors entering into the cost of this commodity with which he is to compete. He should start with the field cost of the gas in the Gulf Coast or Mid-Continent areas, add to that the cost of amortizing a very expensive transmission line—built with capital that is undertaking a great risk and should be permitted an attractive return. To these he must add the cost of compressing, dehydrating and in some cases desulfurizing the gas.

"Then, so that the gas may be available for winter peak delivery, there must be added the cost of underground storage including storage wells, lines, and compressor stations to permit high rates of withdrawal when needed. To enable the maximum economies in transmission, the delivery each day of the year of the entire system should equal 100 per cent of the capacity of the system. Storage capacity must therefore be provided to take up the difference between demand and actual line delivery.

"With volumes in excess of 600 million feet per day to be delivered by the transmission system during the summer as well as in the winter, a serious and costly storage problem is presented. The value of the gas when withdrawn from storage could well be more than double the value of such gas at the time it was placed in storage.

"The producer in the Appalachian area has his gas nearer market and its value should be measured by the demand and availability, keeping in mind that there must be an attractive profit to provide an incentive for continued exploration and development of such remaining reserves as may be produced in the Appalachian area. It is therefore quite obvious that the Appalachian producer should always receive a price never less than the delivered value of the Western and Southwestern gas, taking into account comparative conditions of delivery, pressure, availability, and all other items affecting values."

Kentucky West Virginia Rate Schedule Approved

Kentucky West Virginia Gas Co. has been authorized by the Federal Power Commission to put into effect, as of December 1, 1947, the company's proposed rate schedules, as supplemented by the company on June 2, covering sales of gas to Pittsburgh & West Virginia Gas Co. and to Louisville Gas & Electric Co.

Early this year Kentucky West Virginia Gas Co. proposed four changes in the rate schedules covering sales of its gas to the two customer companies. Three of the changes would have permitted automatic rate adjustments, reflecting increased taxes and production costs, and reduction of the heat content of the gas sold, without notice and filing as required by the Natural Gas Act and FPC regulations. The fourth would have required the customer companies to pay a minimum billing demand whether or not the Kentucky company was able to meet the delivery requirements of the contracts.

By order of March 17 FPC suspended these rate schedules pending a hearing and decision. On June 2 Kentucky West Virginia filed a supplement to the proposed schedules providing that no changes would be made in the rates charged the customer companies or in the heat content of the gas without the required notice and filing. It also provided for a reduction in the originally proposed minimum billing demands. On the basis of these modifications the FPC authorized the proposed rate schedules to go into effect.

Hearing on Change in FPC Rules to Be Set Soon

WASHINGTON.—The Federal Power Commission shortly will announce the date for a public hearing on proposed changes in its general rules and regulations governing rate schedules and tariffs of natural-gas companies subject to its jurisdiction.

The proposed changes were made public last April. The principal changes provide for the filing of natural-gas rate schedules in the form of comprehensive tariffs instead of the individual contracts as permitted under the present rules, a procedure which has been under consideration by the commission for some time and has actually been followed in recent years by a considerable segment of the industry.

Notices of intention to appear and present views at the hearing must be filed before July 15, it was announced.

The commission also has announced that William S. Tarver, Washington attorney, has been appointed an assistant general counsel, to have general supervision over all legal work of the commission in connection with the Natural Gas Act.

Natural Gasoline

Texas Co. Will Modernize Electra Gasoline Plant

Modernization of The Texas Co.'s Electra gasoline plant is to get under way soon, according to C. B. Williams, division manager, West Texas division, at Fort Worth.

The plant, which began operations in 1916 as a compression type natural-gasoline plant, will be installed with absorption and distillation facilities for greater efficiency and recovery of additional butane and propane.

Abercrombie Employes Vote Against O.W.I.U.

HOUSTON.—The Oil Workers International Union (C.I.O.) lost a recent election to represent as collective bargaining agent the production and maintenance employes of J. S. Abercrombie Co.

The election was conducted at Abercrombie's gasoline plant in Old Ocean field near Sweeny, Tex. Of 471 eligible voters, 300 voted against O.W.I.U. representation, and 142 for representation.

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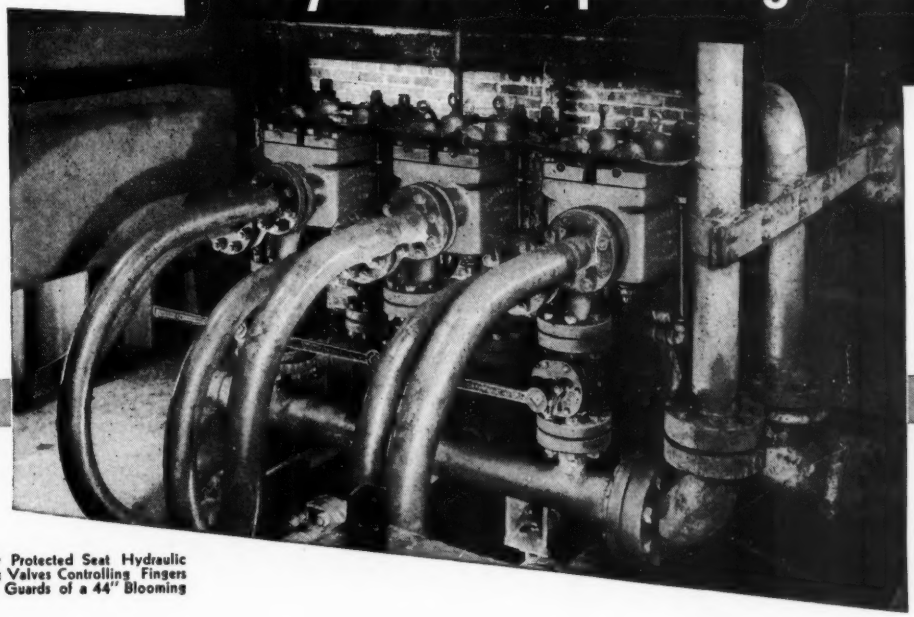

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The "protected-seat" consists of a closely fitted sleeve and an inside plunger which reduce fluid flow to a low velocity trickle while the seat and disc are still widely separated, thus eliminating "wire drawing" or cutting of the seat and resulting leakage and piston "slip."

Maintenance costs are extremely low. Records of twelve to eighteen months continuous service without so much as the replacement of a fiber disc are common.

We will be glad to send you complete details and a copy of Valve Reference Book No. 38 without obligation. Why not write today?

Homestead Protected-Seat Hydraulic Operating Valves are made in 3-way or 4-way types, or in single poppet types to control hydraulic spray for descaling; sizes ½" to 4", hand or remote control, for pressures up to 3000 pounds.

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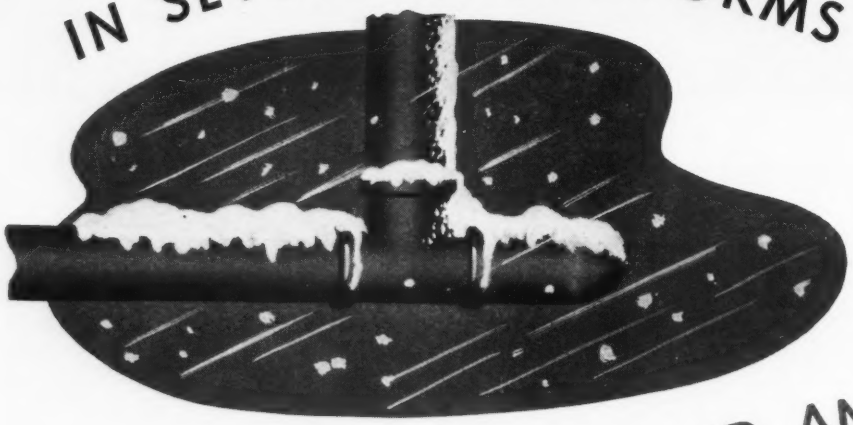

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Exploration and Drilling

California Gets Most Important Strike in Years

"THE biggest strike in California since Kettleman Hills," is the most frequent comment heard concerning Richfield Oil Corp.'s recent discovery in the Cuyama Valley of Santa Barbara and San Luis Obispo counties. Reason for the excitement was the completion of the A-28-5 Russell, 5-10n-27w, for a flow of 500 bbl. daily of light gravity oil and the completion 5 days later of the 2 Anderson-Colgrove, 29-11n-28w, approximately 2½ miles to the northwest, for a flow of 4,000 bbl. daily. The A-28-5 Russell was completed flowing 38.3°-gravity crude through a 48/64-in. choke from 250 ft. of oil saturated sand found at the interval 2,970-3,360 ft. Total depth of the well is 4,218 ft. The 2 Anderson-Colgrove was completed at a total depth of 3,022 ft. flowing 33.0°-gravity crude through perforations at 2,800-3,019 ft. Production from this well has been cut back to 600 bbl. daily.

Considerable speculation has arisen regarding the producing formations, and whether the two wells are in the same field or have opened two separate fields. Richfield, which has spent 4 years making a geologic study of the area, says the two questions cannot be answered until considerably more drilling is done. Several prominent geologists, however, have ventured opinions. They believe the production in both wells is coming from the Temblor formation of the Miocene, although this has not been proved. They think the two wells belong in separate fields. The A-28-5 Russell is believed to have found an accumulation on a long narrow anticline formed by thrusting against a fault which transverses the valley longitudinally (the Whiterock fault). The 2 Anderson-Colgrove is thought to have encountered a stratigraphic trap resulting from a fault overlap against the Caliente Range which borders the Cuyama Valley on the northeast.

It is generally agreed that the Richfield discoveries will have material bearing on the crude oil reserves of the state and have opened the entire Cuyama Valley to exploration. This valley is a sedimentary basin approximately 50 miles long by 15 miles wide, located midway between the oil producing areas of the San Joaquin Valley to the northeast and the Coastal region to the southwest. It is only 30 miles from Richfield's pipe-line system.

The valley is part of a peculiarly long, deep and narrow trough or graben about 300 miles in length and 20 in width which developed in the upper Oligocene and sank rapidly throughout the Miocene. The Cuyama Valley probably emerged at the end of the Miocene, since subsequent series are thin and nonmarine. The entire area was profoundly deformed and eroded during the Quaternary, for the existing sediments are steeply tilted and locally overturned and overthrust.

Due to the deep erosion of the larger anticlines, conditions requisite for the occurrence of major oil or gas fields previously have been thought to be absent, and the area has never been highly regarded as a prospective oil producing region.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN AREA.—Continental's Taylor Sussex wildcat, Natrona County, Wyoming, 10 miles north of Salt Creek field, made 2,000 ft. of 36°-gravity oil in 20-minute drill-stem test of the Lakota, and casing has been run for completion of the new discovery. Ohio and Stanolind recovered 3,000 ft. of oil and 1,890 ft. of oil-cut mud in 1-hour test of the Enos Creek, Hot Springs County, Wyoming, deep test. Tests and cores of General Petroleum's North Sand Creek wildcat, Washakie County, and British American's Longs Creek test, Fremont County, indicate probable producers in the Embar. Continental's deep test at Little Buck Creek, Niobrara County, swabbed 409 bbl. on 24-hour test.

SOUTHERN LOUISIANA.—The Texas Co. has cleared tubing and drill stem dropped in their Queen Bess area venture in Jefferson Parish, the State-Barataria 4, and will now test for production at 15,794-804 ft. The hole was drilled to 16,106 ft. and tests below 16,000 ft. failed.

SOUTHWEST TEXAS.—In Cameron County, 6 miles southeast of Brownsville, The Texas Co. 1 Cameron County Water District, wildcat, is the nation's most southerly drilling well, being 1½ miles from the Mexican border, and is now drilling below 12,275 ft. It will be taken to around 14,000 ft. as one of the deepest ever drilled in this part of South Texas. Another deep wildcat in South Texas, Stanolind Oil & Gas Co. 1 Henry in McMullen County, is at 14,046 ft. fishing for stuck drill pipe.

NORTH TEXAS.—Kleiner pool discovery (Mississippian) has been completed for 96 bbl. of oil in 12 hours. A second test produced 212 bbl. of oil in 24 hours. Operators perforated only 14 ft. of the 300-ft. section which showed for gas and oil. Continental Oil Co.'s Simpson discovery in Wichita County has increased production after acid treatment.

WEST TEXAS.—The Benedum area and outpost wells held interest this week of Permian Basin operators. Late report on Oil Carriers, Inc., 1 Pray-State indicated some shows of oil and gas in the Ellenburger. A 2-hour drill-stem test from 11,790-11,844 ft. recovered 1,530 ft. of clear water cushion, 90 ft. of gas-cut cushion, 270 ft. of oil and gas-cut cushion, 90 ft. of mud and 90 ft. of gas-cut salty mud. The testing tool was found partly plugged and it was believed the salt infiltrated from higher in the hole.

EASTERN TEXAS

Humble's Freestone Well Drilling Below 15,000 Ft.

DALLAS.—Humble Oil & Refining Co. 1 R. P. McWatters, 1½ miles south of Freestone, was drilling ahead below 15,131 ft. in limestone with streaks of shale. It reported first traces of anhydrite from 13,075-13,165 ft., by samples. Humble recently secured a new permit to deepen to 16,500 ft.

J. P. Owens et al 1 Mrs. Willie DeArmon, Jose S. Cordova Survey, in Henderson County, was shut down for orders at 8,371 ft. in sand and shale, and indications were that casing would be set to test shows logged in the Rodessa and Pettit zones. Electric calipers showed a fair kick and fair porosity in the Second Rodessa between 7,695-7,705 ft., and the same in the lower Pettit at 8,165-8,205 ft.

T. D. Humphries 1 E. B. Tuggle, Ed Fitzgerald Survey, 4 miles east of Kemp, in Kaufman County, had total depth at 7,000 ft., plugged back to 6,271 ft. It swabbed salt water with very slight shows of oil from Rodessa perforations at 6,281-86 ft., then squeezed. Perforations at 6,258-62 ft. swabbed salt water with faint gas odor. The next test was planned in the Bacon limestone.

Byrd-Frost, Inc., 1 J. L. Nash, 2½ miles south of Leona in Leon County, reported it was unable to lower fluid below 5,100 ft. from surface while swabbing. Recovery was black, shaly wash water with a small amount of globular free oil, and a very slight show of gas. Casing was shut in while swabbing and pressure built up to 50 psi. in 5 hours.

In Shelby County, Humble Oil & Refining Co. 1-C Pickering had total depth at 9,300 ft., plugged back to 5,328 ft. and was pulling tubing to test upper sections. On a 3-hour flow test from open hole at 5,272-5,328 ft., it produced 16.57 bbl. of 31.6°-gravity oil through ¼-in. choke, cutting 0.1 per cent water. Gas-oil ratio was 13,400 cu. ft. Surface pressure on the tubing was 1,380 psi., and 1,500 psi. on casing. Later it flowed 15.8 bbl. in 2 hours. Another report said the open-hole section between 5,272-5,328 ft. was acidized with 5,000 gal., after which it gaged 132 bbl. of oil through ¼-in. choke, in 24 hours, flowing by heads. Gas-oil ratio was down to 12,750 cu. ft. Another section which may be tested is from 5,167-5,260 ft., which yielded 1,350 ft. of oil on a drill-stem test. Producing formation is the upper Glen Rose.

Four miles east of Humble's 1-C Pickering, Hiawatha Oil & Gas Co. was reported planning to reenter the J. C. Benedum 2 Pickering, J. W. Brittain Survey, which was drilled to the Rodessa at 5,900 ft. 2 years ago. Pipe is to be set to test the Glen Rose around 5,600 ft. which showed gas possibilities while drilling.

New locations for the week totaled 15, spread over 11 counties. Four wildcats were started, one each in Cherokee, Hopkins, Kaufman and Wood counties. Field starters, by counties, were: Henderson 2, Hopkins 1, Houston 1, Robertson 1, and 6 in Wood. Week's completions were 4 oil wells and 6 dry holes, including 5 wildcat failures.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Falls County: Dail Goodson 1 Will Rushing, A DeLa Serda Sur., 2 mi. E McClanahan, dry, TD 4,500 ft., sample tops: Austin 1,917 ft., Buda 2,230 ft., Georgetown 2,340 ft., Glen Rose 2,809 ft.

Henderson County: E. L. Howard et al 1 J. M. Criswell estate, C. M. Walters Sur., 2 mi. SW Athens, dry, TD 9,035 ft., Pecan 2,490 ft., Woodbine 4,299 ft., Buda 5,130 ft., Main Street 5,453 ft., Fort Worth 5,769 ft., by samples: Comanche shale 6,110-40 ft., Goodland 6,198 ft., Paluxy 6,395 ft., Glen Rose 6,765 ft., anhydrite 7,667 ft., Massive anhydrite 7,872 ft., Pettit 8,823 ft., elev. 290 ft.

Navarro County: Humble Oil & Refining Co. 1 B. L. Davis, John Taylor Sur., 7 mi. S Corsicana, dry, TD 2,625 ft., Austin 1,472-1,881 ft., by samples.

San Augustine County: D. H. Byrd 1 J. F. Blount, E. Quirk Sur., 3 mi. W San Augustine, dry, TD 9,017 ft., Midway 2,567 ft., Cretaceous 3,526 ft., Annona 3,841 ft., by samples: Pecan 3,880-4,112 ft., Comanche 5,000 ft., James 7,818 ft., Pettit 8,155 ft., porosity 8,552-72 ft., elev. 411 ft.

Upshur County: Diamond Oil & Exploration Co. 1 fee, Block 7, Huggett Hill Subd., Pritchett townsite, dry, TD 4,088 ft., Pecan 2,570 ft., base Austin 3,682 ft., Eagleford sand 3,682 ft., Woodbine 3,707 ft., Woodbine sand 3,727 ft., by samples, elev. 461 ft.

SOUTH LOUISIANA

Cameron Parish Gets Gas-Condensate Pool

NEW ORLEANS.—Holly Beach, a new gas-condensate pool for Cameron Parish, has been opened 4 miles southeast of Mud Lake production by Magnolia Petroleum Co. 1 Abel West Heirs, in Section 7-15s-10w. Drilled to a total depth of 11,630 ft., with top of sand at 10,817 ft., this well flowed on potential test 55 bbl. of condensate daily through a 12/64-in. choke with gas-condensate ratio 61,455, and gas flow of 3,361,000 cu ft. per day. Flowing pressure on tubing was 3,325 psi., shut-in pressure 3,590 psi., gravity 53.2°. Production is through perforations at 10,817-822 ft.

A new oil-producing sand for Bay de Chene field of Lafourche Parish was opened by The Texas Co. 6 State-Bay de Chene, Lease 356, flowing 32 bbl. of oil per day, through a 10/64-in. choke. Top of new sand at 3,696 ft., and perforations for completion at 3,696-3,702 ft. Gravity is 28.9°, and no water in the flow, tubing pressure 280 psi. Total depth is 8,940 ft.

In St. Mary Parish, South Jeanerette field, Atlantic Refining Co. 2-B Adeline Sugar Factory Co., was completed in a new sand for the field, flowing a million cubic feet of gas per day through a ¼-in. choke. Production is through perforations at 3,210-20 ft.

Barnsdall Oil Co. 2 Edgewood, new discovery in Section 14-6s-10w, approximately 2 miles southwest of Longville production in Beauregard Parish, flowed 146 bbl. of condensate per day with 1,540,000 cu. ft. of gas through 11/64-in. choke through perforations at 8,458-63 ft. It is now waiting on official potential. Gravity is 59°, tubing pressure 2,575 psi. Total depth is 9,300 ft., and 5½-in. casing was set to 8,556 ft.

The Texas Co. 111 LLE-Leeville, 2-22s-22e, 4,500 ft. off southeast flank of the Leeville Dome in Lafourche Parish, has been drilled to a total depth of 14,207 ft. Operators encountered broken section of shale and sand with oil and gas shows 13,804-14,087 ft. with slight show of oil from there to bottom, no water reported. Now waiting on casing.

The 17 new locations reported this week included 3 wildcat starts, 1 each in Calcasieu, Iberville, and Lafourche parishes. Two successful tests opened a new oil pool in Cameron Parish and a new oil sand in Bay de Chene pool of Lafourche Parish. One wildcat was dry in Calcasieu Parish.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Cameron Parish: New gas-condensate field, Holly Beach—Magnolia Pet. Co. 1 Abel West Hrs., 7-15s-10w, 4 mi. SE of Mud Lake Gas & Cond. production & 1½ mi. off SE side of Mud Lake, TD 11,630 ft., top sand 10,817 ft., perf. 10,817-822 ft., IP: 55 bbl. condensate per day through 12/64-in. choke, GOR 61,455, and 3,361,000 cu. ft. gas per day, TP 3,325 psi., shut-in pressure 3,590 psi., gravity 53.2°, no water.

Lafourche Parish: New oil sand, Bay De Chene—The Texas Co. 6 State-Bay De Chene, Lease 356, in Bay De Chene, TD 8,940 ft., top sand 3,696 ft., perf. 3,696-3,702 ft., IP: 32 bbl. oil per day through a 10/64-in. choke, GOR 5,880, TP 280 psi., gravity 28.9°, no water.

SOUTH LOUISIANA WILDCAT FAILURE

Calcasieu Parish: Sid W. Richardson, Inc., 1 R. Benoit, in 24-9s-7w, 1 mi. S of Iowa field production, dry, TD 11,500 ft. in salt. Top salt 11,434 ft.

N. CENTRAL TEXAS

Lone Star Plans Offset To Mississippi Discovery

WICHITA FALLS.—Lone Star Producing Co. ran completion potentials at its A-1 Charles J. Kleiner, Eastland County, Mississippi limestone discovery, applied for discovery allowable, and asked that the new producing area be named Kleiner field, inasmuch as production to the south is on a separate structure in shallow sand. On Railroad Commission potential test, the well flowed 96 bbl. of oil in 12 hours through 20/64-in. tubing choke. It followed that by flowing 212.58 bbl. of oil in 24 hours. The well showed gas from the top of the lime at 3,699 ft., and had base at 4,040 ft., but perforations were made from 4,000-14 ft. where electrical log indicated best porosity. A south offset was to get under way immediately.

Continental Oil Co. 1 Hausler Brothers, Simpson discovery that attracted considerable attention when it brought production to the outskirts of Continental's refinery northeast of Wichita Falls, reported an increase in oil after acid treatment. Mud acid was injected through casing perforations from 5,688-94 ft. When the oil load was swabbed off, it flowed 128 bbl. of oil. Placed on ¾-in. choke, it flowed 148 bbl. of oil in 22 hours. Another report indicated the acid treatment was made from 5,686-5,704 ft. Testing was to continue.

Another producer for the Chico Bend conglomerate field of Wise County was in prospect at Cities Service Oil Co. 1 R. O. Garrett, Thompson Survey, when it recovered 270 ft. of oil and gas-cut drilling fluid on a drill-stem test of the conglomerate from 5,245-80 ft. Operators said heavy mud in the hole made the test unsatisfactory, and were to run casing for further tests. An earlier test, in the Caddo at 5,142-70 ft., recovered 80 ft. of oil-cut mud.

In Young County, Nu Enamel Oil Corp. 1 Morrison, H. Hodges Survey, 5 miles south of Murray, had some shows of oil in the Caddo lime. It topped the lime at 3,570 ft. First drill-stem test between 3,570-84 ft. returned 15 ft. of drilling mud. Drilled deeper, a 30-minute test from 3,587-96 ft. recovered 30 ft. of oil-cut mud. From 3,650-57 ft., a 1-hour test recovered 20 ft. of slightly oil and gas-cut drilling mud. Operators drilled ahead below 3,750 ft.

In western Young County, 6½ miles west of Graham, Hanlon-Boyle, Inc., and Ben H. Rankin 1 V. Holcomb, R. J. Fisher Survey, set casing to 4,058 ft. after drilling to 4,751 ft. It topped the Ellenburger at 4,684 ft., but has had no shows.

Two miles south of Olney, Macoil Corp. 1 H. G. Rothell, Block 214, TE&L Survey, logged an oil sand from 3,990-4,000 ft. A 2-hour drill-stem test of that interval recovered 35 ft. of oil and gas-cut drilling mud. It also showed oil in the Caddo, topped at 4,141 ft., and recovered about the same amount of oil-cut mud on a test from 4,141-59 ft. It was drilling ahead.

In Montague County, Moran Brothers 1 Williams, J. W. Kelly Survey, 4½ miles southwest of St. Jo, was below 4,986 ft., with no shows reported. A new Strawn sand test

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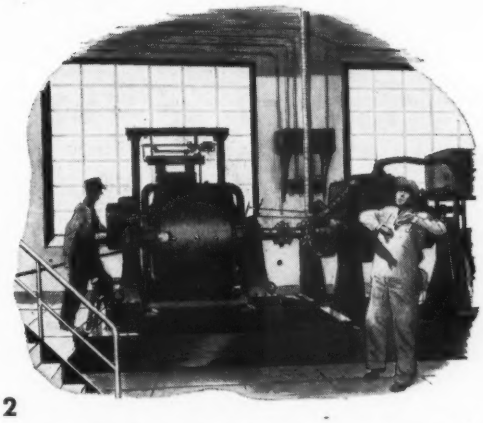
"Rev 'er up" is the cry as truck engines roar up to 3000 RPM on giant test stands. It's done to make sure they'll stand the gaff. But occasionally an engine gets ornery — backfires; stops suddenly. Shock! Plenty of it. But what's a backfire to you? Well, what Morse Chain Company did about it may be a boon to *your* business, too . . .



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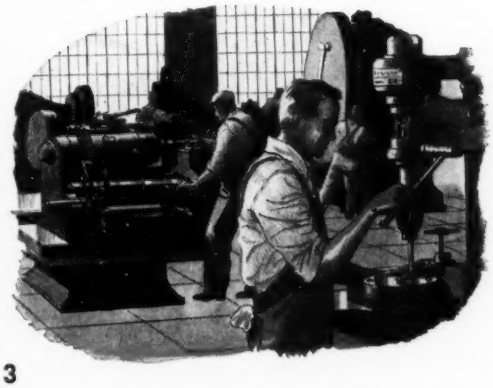

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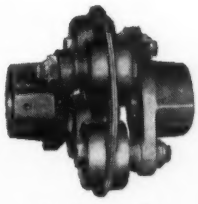
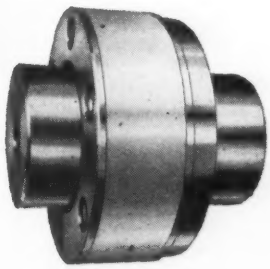


Morflex Coupling



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was reported 2 miles northwest of Dye Mount, as B. F. Phillips et al 1 Tompkins, 1,740 ft. from northeast and 440 ft. from northwest lines of Lot 24, Calhoun CSL. Planned depth is 3,400 ft.

First reports on new wells in North Texas areas (District 9), totaled 44, including 8 wildcat starts. Locations for field wells, by counties, were: Archer 7, Clay 7, Wichita 8, Young 6, Montague 3, Cooke 3, and Jack 2. Counties gaining wildcat locations were: Young 2, Archer 5, and Cooke 1. Week's completions for the same area were: 16 oil wells, 14 gas, including 5 wildcat failures.

In West Central Texas (District 7-B), new starts totaled 43, including 22 wildcats. Field locations, by counties, were: Jones 5, Shackelford and Coleman 4 each, Comanche and Taylor 3 each, Eastland and Brown 2 each, and 1 each in Palo Pinto, Stephens and Throckmorton. Wildcats were: Brown, Callahan, Coleman and Taylor 3 each, Comanche and Stephens 2 each, and 1 each for Eastland, Fisher, Jones, Parker, Runnels and Throckmorton.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCAT

Taylor County: West Central Drilling Co. 1 Ennis Reidenbach, Blk. 12, League 146, Grimes CSL, 10 mi. S Merkel, flowed 80 bbl. 42°-gravity oil in 3 hours, 5/16-in. choke, perforated in limestone 2,498-2,503 ft., TD 2,886 ft., tubing pressure 50 psi., casing pressure 250 psi., GOR 200 cu. ft., elev. 1,859 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Callahan County: Star Oil Co. H. W. Ross, Sec. 103, BBB&CRR Sur., 1 mi. NW Baird, dry, TD 4,710 ft., Caddo 4,002 ft. tested sulfur water, PB 4,630 ft., reperforated 4,530-80 ft., acidized, tested slight show oil and gas, same for perforations 4,555-80 ft., reported not plugged.

Cooke County: Kadane Griffith Oil Co. 1 Joe Parker, P. G. Yarbrough Sur., 1 mi. E Hood, dry, TD 1,625 ft., show oil in sand and lime 1,235-69 ft.

R. W. Fair et al 1 D. L. Monroe, A. Dozier Sur., 3½ mi. W Gainesville, dry, TD 2,938 ft.

R. B. Hollondsworth 1 J. A. Becker, Blk. 10, George Ivey Sur., 2½ mi. NW Muenster, dry, TD 2,280 ft., sand 2,069 ft.

Russell Maguire & Fleet Drilling Co. 1 Anna Loerwold, M. Alexander Sur., 1½ mi. NW Lindsay, dry, TD 1,972 ft. in lime.

Stephens County: Star Oil Co. 1 J. A. Caldwell estate, Blk. 32, OAL Sur., 2 mi. S Eolian, dry, TD 4,323 ft., Caddo 3,442 ft., Ellenburger 4,205 ft., elev. 1,227 ft.

Wichita County: Fortex Oil Corp. 1 Mary Bishop, J. Hadden Sur., 2 mi. N Burkburnett, dry, TD 2,000 ft. in shale and sand.

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SOUTHWEST TEXAS

Shows Are Found in Milam County Wildcat

CORPUS CHRISTI.—In Milam County, 3 miles west of Gause and 8 miles northeast of Milano, Standard Oil Co. of Texas 1 Lucinda Greene et al, wildcat test, recovered 90 ft. of gas-cut mud, 490 ft. of oily mud, and 30 ft. of clean 29.8°-gravity oil on 19-minute drill-stem test at 5,675-5,712 ft. in the top of the Edwards lime. Operators are coring ahead into the Edwards lime zone below 5,730 ft. The well is located in W. D. Thompson Survey A-368.

Agua Dulce field, Nueces County, has been extended northeast by Seaboard Oil Co. 1 J. C. Robertson. On potential test flowed 66 bbl. of oil per day with no water, gas-oil ratio 364, through a 5/32-in. choke. Tubing pressure 190 psi. casing sealed. Production is through perforations at 5,090-95 ft. This is a rework of an old dry hole, old total depth 5,525 ft., new plugged back depth is 5,095 ft. The well is located in Block 5, Partition of Wright lands.

Sullivan & Garnett 1 Geo. E. Shelly et al, wildcat on the south end of Lamar Peninsula, and ½ mile east of the Lamar townsite, in Aransas County, recovered 1,200 ft. of oil and 5,300 ft. of salt water and water-cut mud on a drill-stem test open 40 minutes, through a ¼-in. choke, with 8 psi. working pressure, through perforations at 7,430-35 ft. These perforations have been squeezed and the well is being retested in an attempt to bring in a commercial producer. Total depth is 7,600 ft. The well is located in Tract 2 out of Reserve "D" Survey.

The 46 new locations reported this week included 9 wildcat starts, 2 each in Starr and Zavala counties and 1 east in Atascosa, Caldwell, Duval, and Gillespie counties. Wildcat failures are 3 in Duval, and 1 each in Bastrop, Bexar, Frio, Jim Hogg, Jim Wells, Lavaca, Starr and Zavala counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Bastrop County: Jarman-Hill-Drews 1 John Alexander Est., in J. Billingsley Sur., 2½ mi. S of Cedar Creek, dry, TD 1,972 ft.

Bexar County: Anderson Prichard Oil Corp. 1 E. H. Yturria et al, in Adam Stafford Sur. 49, 10 mi. SE of San Antonio, dry, TD 4,301 ft. in Schist, top Schist 4,299 ft.

Duval County: Saltmount Oil Co. 1 Solar Oil Co., in BS&F Sur. 531, 1½ mi. NW Noleda, on W flank of Piedras Pintas dome & 1 mi. W of Piedras Pintas field, dry, TD 4,005 ft.

Bridwell Oil Co. 1 E. R. Hagist Ranch, in BS&F Sur. 122, 12 mi. N-NE of Freer, dry, TD 2,529 ft.

L. L. Blomgren, Ralph Rowden & Dale H. Rowden 2 A. Weil Hrs., in B. Elizando Sur. 568, ⅔ mi. N of production at Akin field, 18 mi. SW of Freer, dry, TD 3,137 ft.

Frio County: George Parker & Charles L. McCune 1 Oppenheimer & Lang, in Henry Castro Sur. A-175, 12 mi. E of Pearsall, dry, TD 5,203 ft.

Jim Hogg County: Don H. Marsh et al 1 C. W. Hellen, in Ygnacio Mora Sur. 24, 18 mi. SW of Hebbronville & 2 mi. E of Randado, dry, TD 2,712 ft.

Jim Wells County: C. G. Glasscock, Jr., 1 Mrs. M. J. Allison Est., in Blk. 16, Sec. 7, Scott Subd. of Benton Pastures, 1 mi. NW of Stratton field, 6 mi. SW of Agua Dulce, dry, TD 6,508 ft.

Lavaca County: The Pure Oil Co. 1 Fred Schultz, in John Douglas Sur., A-126, 6 mi. E of Yoakum, 3 mi. SE of Sweethome, & 5 mi. NE of Yoakum field, dry, TD 9,704 ft.

Starr County: Continental Oil Co. G-2 T. B. Slick Est., in CCSD&RGNG Sur. 541, dry, TD 5,488 ft.

Zavala County: Thornton Davis 1 Lillian S. Winterbotham, in Juan Jose Cervantes Sur. 96, A-94, 18 mi. W of Dilley & 3 mi. NW of Leona River field, dry, TD 4,510 ft.

APPALACHIAN FIELD

Four New Oil Wells Are Completed Near Silverton

PITTSBURGH.—Near Silverton in Ravenswood district, Jackson County, West Virginia, four oil wells were completed increasing the total production 200 bbl. a day. F. S. Deem 1 Harvey Bennett was good for 55 bbl., Berea, total depth 2,144 ft.; Ellsworth Jordan 1 W. H. Moore, town lot, 75 bbl., Berea total depth 2,144 ft.; John Sandy 1 Board of Education, 60 bbl., Berea, total depth 2.148 ft.; Columbian Carbon Co. 1 J. A. Suck, 10 bbl., Berea, total depth 2,100 ft. This pool is being very closely drilled.

In Portland district, Preston County, Snee, Eberly et al attempted to kill the No. 1 Cora E. Lewis, an Onondaga chert gas well, using pressure and a column of salt water, to fish for tools lost when trying to drill ahead slightly after cleaning out. New gas was struck which blew the tools 1,100 ft. up the hole causing the hole to bridge after the gas was turned in the lines. As soon as the head was opened the water began to unload rapidly and as high as the derrick. A gage of the gas showed 5,000,000 cu. ft. or almost 2,000,000 cu. ft. more than the original volume when completed last year. Other wells had to be shut in in this new gas pool and this well was turned in the line feeding 4,000,000 cu. ft. with 1,000 psi. back pressure.

In Oceana district, Wyoming County, Hope Natural Gas Co. completed 2 good gas wells. No. 9,180 Loup Creek Colliery Co. was good for 1,042,000 cu. ft. of gas after shooting the Ravencliff sand and with a rock pressure of 400 psi. in 24 hours from a total depth of 3,009 ft. No. 9,200 M. D. Cooks gaged 3,431,000 cu. ft. gas, natural, from the Maxton sand and had a rock pressure of 545 psi. in 24 hours from a total depth of 1,864 ft.

New locations totaled four and were in Boggs Township, Armstrong County; Ringgold Township, Jefferson County; and Amwell and West Bethlehem townships, Washington County.

WEST VIRGINIA SUCCESSFUL WILDCAT

Fayette County, Fayetteville district: Godfrey L. Cabot, Inc., 1,276 Oak Hill Investment Co., 2,144,000 cu. ft. gas; Big lime 2,270-2,600 ft., sand 2,696-2,723 ft., gas 2,716-22 ft., rock pressure 720 psi. 24 hours, TD 2,723 ft.

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Wear...Much has been said about diesel-engine speed versus maintenance. But in actual practice, slow-speed engines and medium-speed engines of the same horsepower rating have almost the same piston-travel and journal-travel per minute.

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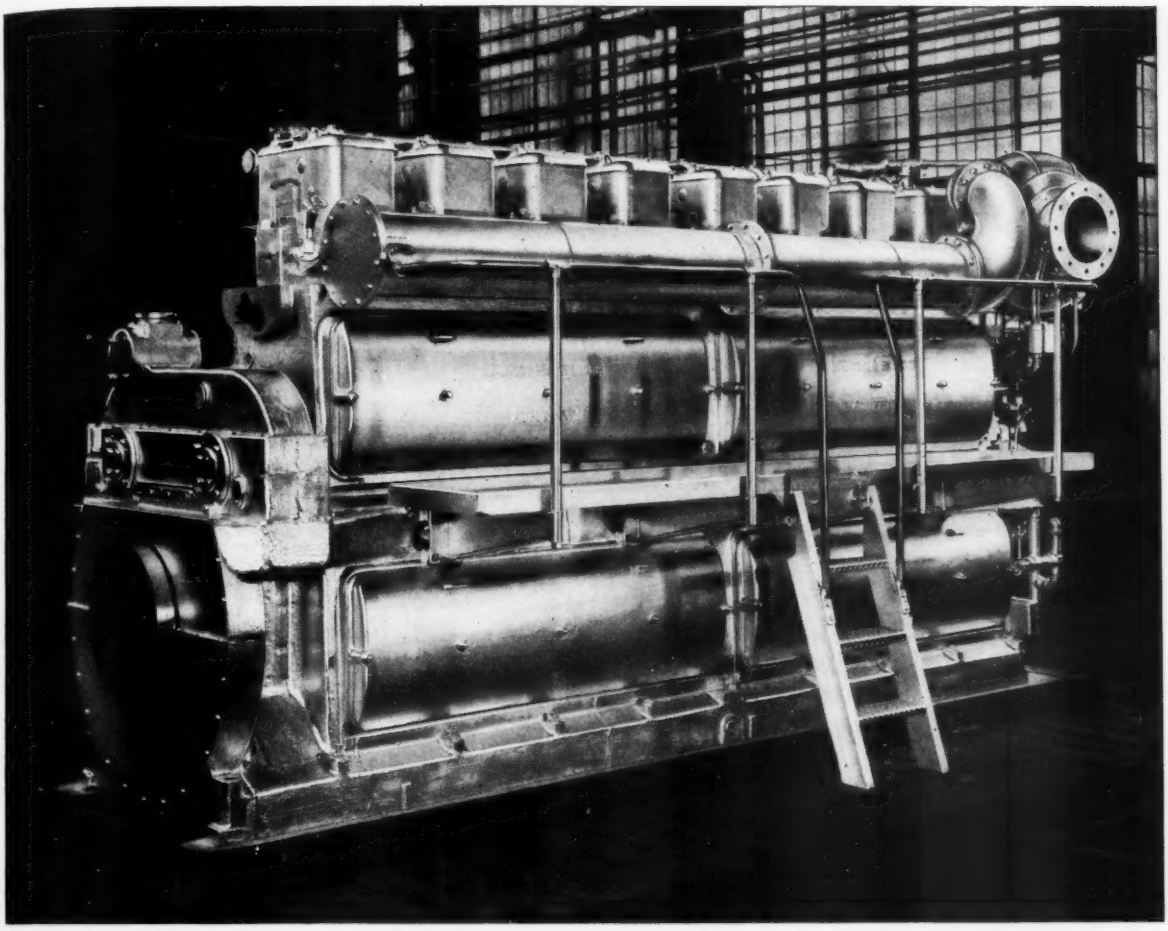

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MICHIGAN

10 Producers Added To Michigan Total

SAGINAW. — The oil producers among the record 27 oil and gas drilling completions recorded in Michigan for the past week added 1,100 bbl. to the state's daily potential. Producers rated at 250 bbl. from two locations in Allegan County and one in Kalakaska accounted for the bulk of new production. Fourteen new locations were announced.

Completions include four gas wells, three in Clare County, one in Osceola, and 13 dry holes, seven of which were wildcats. The Kalkaska producer came in at 4,365 ft. In Osceola County another deep test was a failure at 5,317 ft.

The new locations are in eight counties, Pure Oil Co. planning three in Beaver Creek Township, Crawford County. Two locations each are set for Montcalm, Newaygo and Van Buren, one each in Isabella, Bay, Livingston and Ogemaw.

MICHIGAN WILDCAT FAILURES

Allegan County, Dorr Township: Ford Henry 1 Jacob Thomas, SE SE NE 18-4n-12w, dry in Traverse limestone, TD 1,735 ft.

Wayland Township: Ford Oil Co. 1 Charles D. Krizik, NW SE NW 7-3n-11w, dry in Traverse, TD 1,828 ft.

Montclam County, Bushnell Township: Leonard Oil, Inc., 1 Max D. Miller, NE SE NW 30-9n-6w, dry in Dundee, TD 3,268 ft.

Osceola County, Cedar Township: Union Development Co. 1 May Richardson, NE SE NE 10-18n-9w, dry, TD 5,317 ft.

St. Joseph County, Lockport Township: Stuart L. Godfrey 1 Helen Marchal, NW NW SE 10-6s-11w, dry in Traverse limestone, TD 1,002 ft.

Shiawassee County, Perry Township: Panhandle Eastern Pipe Line Co. 1 Roy D. Casady, SE SE SE 34-5n-2e, dry in Dundee, TD 2,756 ft.

Van Buren County, Keeler Township: Ohio Oil Co. 1 Percy Weber, NE NE SW 18-4s-16w, dry in Traverse limestone, TD 891 ft.

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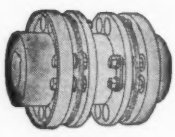
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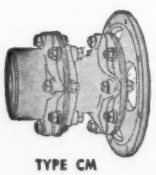
Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.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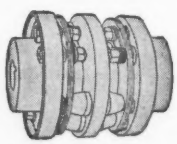
Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.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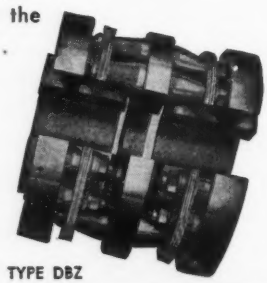
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CANADIAN FIELDS

Water Flooding Steps Up Flow From Wild Well

CHATHAM. — After being cut down to approximately 6,000 bbl., Atlantic 3 wild well in Leduc field, has stepped up its flow to a record high between 11,000 and 14,000 bbl. daily. The field, however, is being kept in production, with some 40 producers restricted to 120 bbl. daily for D-3 and 80 bbl. daily for D-2 wells. A major part of the Atlantic 39 flow is being pumped back into wells 1 and 2, while the Nisku pipe line and tank trucks are carrying about 14,000 bbl. daily from the field.

Attempts to kill the Atlantic 3 flow by flooding the formation with water, forced in through Imperial 48, appear to have stimulated the flow. Accumulated surface oil, however, has been drained off, eliminating the fire hazard, and it is expected that the relief wells, directionally drilled from south and west of Atlantic 3, will tap the latter early in July, enabling Alberta government and oil company experts to bring the well under complete control.

Eleven new wells have been placed in condition for restricted production. These showed open-flow potentials between 1,000 and 3,000 bbl. with a total of 22,270 bbl. cut back by conservation restrictions to around 1,200 bbl. daily. Detailed figures on these wells have not been released.

Since early June Leduc crude has been moving by truck at approximately 2,000 bbl. daily to the new Imperial refinery at Edmonton, though operation of the first refinery unit will not start till late in July.

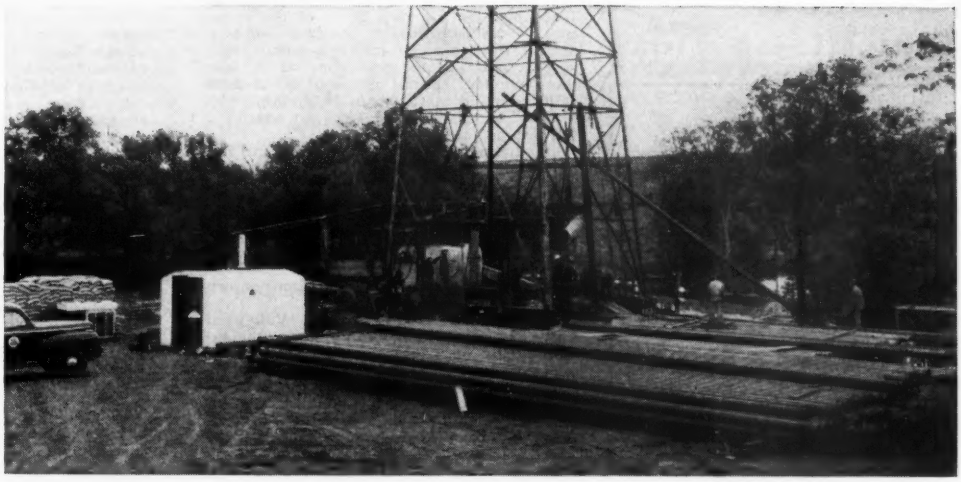
Open-flow tests of eight recently completed Imperial wells show: Imperial 48, LSD 3, 28-50-26w4, at 5,080 ft., 65 bbl. an hour; Imperial 53, LSD 9, 20-50-26w4, 5,352 ft., 123 bbl. an hour; Imperial 54, LSD 10, 22-50-26w4, 5,352 ft., 44 bbl. an hour; Imperial 60, LSD 11, 20-50-26w4, 5,358 ft., 73 bbl. an hour; Imperial 66, LSD 6, 34-50-26w4, 5,060 ft., 106 bbl. an hour; Imperial 67, LSD 16, 20-50-26w4, 5,115 ft., 106 bbl. an hour. In the Woodbend area, Imperial-Woodbend 2, LSD 4, 15-51-26w4, at 5,316 ft., has 73 bbl. an hour and No. 3, LSD 9, 16-51-26w4, at 5,320 ft., has 60 bbl. All will produce on a sharply restricted basis. Imperial has 14 other wells in various stages of completion, with three new tests spudded: No. 77, LSD 3, 34-50-26w4; No. 78, LSD 4, 28-50-26w4, and No. 80, LSD 16, 26-50-26w4.

Central Co-Op 3, LSD 12, 25-50-26w4, finished at 5,305 ft., showed 136 bbl. an hour on initial tests. Co-Op Leduc 2, LSD 6, 35-50-26w4, finished at 5,089 ft., is starting initial flow tests. Globe-Leduc 7, LSD 5, 19-50-26w4, plugged back to D-2 zone from 5,353 ft., is making 132 bbl. daily on 21/64 choke in early tests. Home-Leduc 4, LSD 14, 21-50-26w4, is testing at 5,095 ft. and Home-Leduc 5, LSD 12, 21-50-26w4, at 5,363 ft.

Turner Valley.—In Turner Valley field, Royalite 87, LSD 11, 9-21-3w5, east side test in the north extension, has contracted the Madison limestone at 10,017 ft. and is setting casing and surveying hole before deepening.

Pincher Creek.—Results of the Gulf-Canadian deep test in the Pincher Creek area in the southern foothills should be known very soon. The well, in LSD 15, 24-3-29w4, is coring below 12,516 ft. and preparing to run 6-in. casing which will be perforated

DEPENDABILITY



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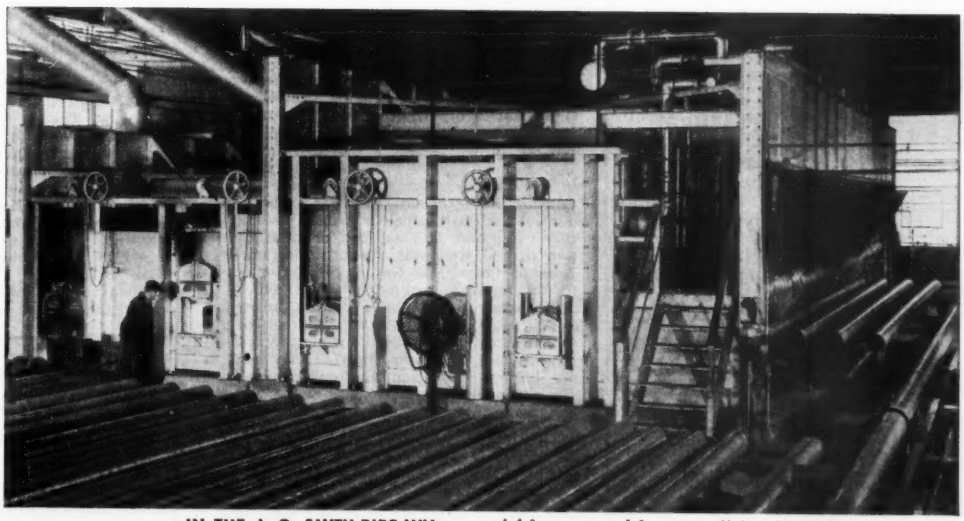

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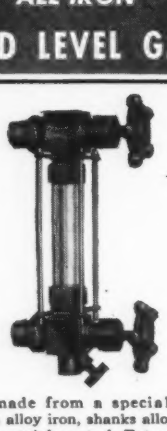

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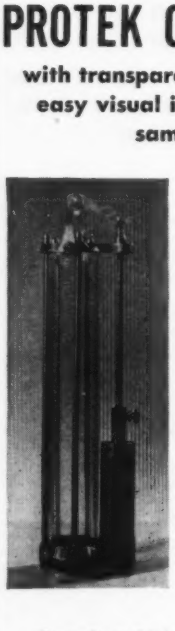

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at favorable horizons in the lower zone of the limestone. Gulf Canadian-Marr 1, LSD 1, 29-4-29w4, is below 2,451 ft.

Vermilion.—Inactive for some years, Vermilion field in eastern Alberta will be given a Devonian test by South End Petroleums of Vancouver, which has taken up 4,838 acres in Townships 48-48, Ranges 7 and 8w4, on the west flank of the structure. Pacalta-Battleview, Section 5-48-5w4, drilled by the same interests some years ago, is believed to have gone 72 ft. into the Devonian, getting shows of oil at 2,409 ft. Production in the main field, 48,620 bbl. in May, is heavy crude from an overlying Cretaceous horizon.

Lloydminster.—A Devonian limestone test on a unitized basis is also being planned for the Lloydminster field, where heavy oil is secured in the Sparky sand at around 1,980 ft. Ten local companies are planning to share the cost, estimated at $50,000. Top of the Devonian is estimated around 2,200 ft., but drilling to around 3,500 ft. may be necessary to test the various horizons shown productive in Leduc field.

Flathead Valley.—In Flathead Valley of southeastern British Columbia, Amalgamated Oils of Vancouver has secured an exploration permit from the provincial government on 60,000 acres, including most of the known structures on the east side of the valley from a point 15 miles north of the international boundary, as well as 12,000 acres west of the river. Geological survey work is being started, preparatory to actual drilling. Inconclusive tests already drilled in the area have encountered showings of gas and light oil.

ROCKY MOUNTAIN

Four Probable Discoveries Reported in Wyoming

DENVER.—Four interesting probable discoveries were made in Wyoming during the week, increasing leasing and exploratory activity throughout the entire state. In Johnson County, north of Salt Creek field, Continental Oil Co. recovered 2,000 ft. of 36°-gravity green oil on 20-minute drill-stem test of its wildcat at 1 Coles, NW NW SE 17-42n-78w, in the Taylor Sussex area. The well topped the Lakota formation at 7,689 ft. and the test was made between 7,693-7,726 ft., total depth. Gas was at the surface in 3 minutes and was estimated at 500,000 cu. ft. per day. Flowing pressure was reported at 1,300 psi. The discovery is of importance as the first in recent years on the west side of the Powder River basin. Frontier sands, productive at Salt Creek, carried water in this well, and Dakota, the original objective of the test, was absent. Amerada Petroleum Corp. and Union Oil Co. of California have assembled a large block of leases immediately north of the Continental Sussex unit and plan a wildcat test in this area during this year. Continental is running casing for completion of the well in the Lakota formation and another well is planned on the structure immediately.

A new pay is apparent in Ohio Oil Co. and Stanolind Oil & Gas Co.'s deep test of Enos Creek field, Hot Springs County, Wyoming. The well topped the Phosphoria at 6,150 ft. and on drill-stem test 6,149-82 ft. made 3,050 ft. of black, 27°-gravity oil and 1,890 ft. of oil-cut mud in 1 hour. Enos Creek was discovered in 1924 when a well found gas in the Frontier formation at 2,835-50 ft. The Dakota carried water on the structure and the field has been shut in since discovery. The present well, located in the SE SW NW 25-46n-100w, is the first test below the Dakota. The operators are continuing to core and will test the Tensleep before completing the well.

In the Sand Creek unit, General Petroleum Corp. 65-2-G, NE NW SE 2-26n-91w, Washakie County, Wyoming, recovered gas-cut mud from the Embar formation after coring oil saturated lime. The test was made between 9,440-48 ft. and 750 ft. of gas-cut mud with slight oil show was recovered in 1 hour. The operator is drilling and coring ahead and will test the Tensleep before plugging back for more complete tests of the Embar. The saturation encountered may prove commercial as other deep tests in this section of the basin, at Worland, Neiber Dome, and South Fork, found the Embar tight but flowed oil following acidizing. This well is located 3¼ miles north of General Petroleum's Frontier formation producing pool at Sand Creek and is believed to be on a separate high. Frontier in this well was water bearing and possibilities of production were not considered too good prior to coring the saturated Embar lime.

Cores of British-American Oil Producing Co.'s Longs Creek wildcat at 1 Unit, C NW NE 5-31n-94w, 5 miles southeast of Sand Draw field in Fremont County, Wyoming, showed saturation but on drill-stem test 5,286-5,328 ft. the well made sulfur gas at the rate of 622,000 cu. ft. per day. Several tests in this formation have shown gas, but cores continued to show oil staining. This well is now drilling 5,400 ft., still in basal Embar, and the Tensleep sand, productive at Sand Draw, is expected within the next few feet. The well topped the Embar (Phosphoria) at 5,202 ft.

In Niobrara County, Wyoming, Continental Oil Co. 12 ECLU "B," NW NE SE 28-36n-64w, Little Buck Creek field, tested at the rate of 409 bbl. of 31°-gravity black oil in 24 hours, with fluid level at 2,700 ft. This is the first deep test in the field and production is from the second bench of the Leo (Pennsylvanian) sand. The well was drilled to 6,004 ft., total depth, and casing run to 5,960 ft. and perforated between 5,900-40 ft. This field was discovered in 1944 and a total of 14 Dakota sand wells have been completed in the field.

New locations.—There were a total of 27 new locations during the week, with 13 in Montana, 11 in Wyoming and 3 in Colorado. In Wyoming Wilshire Oil Co. of California has made location for a wildcat test in the Rawhide area, Park County, at 1 Government, Lot 2, 16-49n-102w. The well will go to Madison at around 5,000 ft. The well is located on a block farmed out by Cities Service Oil Co. to Wilshire and will be Wilshire's first Rocky Mountain operation. Texas Co. is now drilling below 500 ft. on a second wildcat in the Moorcroft area, Crook County, at 2 Robinson, NW SW SE 8-49n-67w. This is the second well in this area by Texas with the first recently abandoned after failing to find production through the Dakota sand. The operations are based on stratigraphic trap possibilities on the eastern side of the Powder River basin. In Rio Blanco County, Colorado, Frontier Refining Co. has moved in rotary to rework its 1 Government, C S½ NW NW 32-2n-96w, in the White River field. The well was drilled to 7,005 ft., total depth, 3 years ago and had shows of gas in Tertiary

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sands at around 5,000 ft. The operator will whipstock and redrill this section to determine the commercial possibilities in this zone. In Montana A. B. Cobb (Phillips Petroleum Co.) has made location for a Madison test in the southwest Pondera area, Pondera County. The well is 37-25 Rice, NW SE SW 25-27n-5w.

Completions. — Twenty-four wells were completed, with a total daily initial of 2,382 bbl. of oil. Ten of the wells were in Wyoming, 10 in Montana, 3 in Colorado, and 1 in northern New Mexico. In Colorado Huber-Frontier abandoned the fourth and final attempt to find oil on its 125,000-acre block in western Baca County. The well went to 5,322 ft., total depth, and found the St. Louis at 5,234 ft. No shows were reported in the well. Seaboard's Eureka Lake wildcat has been abandoned at 2,950 ft. after finding water in the Madison. This was one of several tests planned in the Mountain Front area of western Montana. In the Bonita area, McKinley County, New Mexico, Lion has abandoned its wildcat at 4,010 ft., total depth, after checking the Dakota and Morrison formations.

WILDCAT FAILURE IN WYOMING

Moorcroft, Crook County, Texas 1 L. H. Robinson, NW NW NE 9-49n-67w, 4,960 ft. TD, abnd., Niobrara 2,855, Frontier 3,298, Greenhorn 3,492, Dakota 4,750, elev. 4,375 RB.

WILDCAT FAILURE IN COLORADO

Freezout, Baca County, Huber - Frontier 1 McCarroll, SW SW NE 11-28s-50w, 5,322 ft. TD, abnd., Triassic 555, Permian 1,120, Day Creek 1,280, Blaine 1,510, Penn. 3,000, Shawnee (?) 3,205, Lansing (?) 3,530, Des Moines (?) 3,881, Morrow (?) 4,700, Mississippian 5,131, St. Louis 5,234, elev. 4,534 KB.

WILDCAT FAILURE IN MONTANA

Eureka Lake, Teton County, Seaboard 48-23 Stonehouse, SE SE SW 23-25n-6w, 2,950 ft. TD, abnd., First Kootenai 2,085, Morrison 2,475, Ribbon sand 2,590, Madison 2,758, elev. 4,142 ground.

WILDCAT FAILURE IN NORTHERN NEW MEXICO

Bonita, McKinley County, Lion Oil 1 Honey-State, SE NW NE 30-20n-10w, 4,010 ft. TD, abnd., Dakota 3,322, Morrison 3,683, elev. 6,260 ground.

MISSISSIPPI

Humble Completes Mallalieu Field Well

JACKSON.—In the Mallalieu field, Lincoln County, Humble Oil & Refining Co. B-1 E. C. Hart et al Unit, Section 7-6n-8e, was completed flowing 263 bbl. of 39.1°-gravity oil per day through a ¼-in. choke, tubing pressure 500 psi., casing pressure 600 psi., with ratio of 256. Total depth is 10,528 ft., and production is through perforations at 10,514-27 ft., with top of Lower Tuscaloosa at 10,385 ft.

Humble B-7 G. M. & O. Land Co., 14-9n-8w, in Yellow Creek field, Wayne County, was drilled to a total depth of 5,227 ft., and on potential pumped 102 bbl. of 20.1°-gravity oil per day, 3 per cent basic sediment and water. Production is through perforations at 10,514-27 ft. Top of Marine Tuscaloosa 10,147 ft., Lower Tuscaloosa 10,385 ft.

Seven new locations reported included 4 wildcat starts, 1 each in Issaquena, Stone, Wayne, and Yazoo counties, and 3 development locations, 1 each in Brookhaven field Lincoln County; La Grange field Adams County; and Soso field Jones County.

TENNESSEE WILDCAT FAILURE

Grundy County: Magnolia 1 Patterson, 1-C-55, dry, TD 4,413 ft., no tops reported.

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TEXAS GULF COAST

Sohio Opens New Field In Lane City Townsite

HOUSTON.—A new oil field for Wharton County has been opened in the Lane City townsite by the Sohio Petroleum Co. 1 Lane City Unit, Block 27, in the D. D. D. Baker Survey, Drilled to a total depth of 6,283 ft., this well flowed on initial gage 120 bbl. of 25.7°-gravity oil through a ⅛-in. choke. Flowing pressure on the tubing was 610 psi. The 5½-in. casing was set at 5,550 ft., and completion was made through perforations at 5,464-5,478 ft. The well now is shut in awaiting additional storage.

Jack W. Frazier 1 Lillie O. Hurlock, wildcat test in the Iowa Colony area of Brazoria County, is flowing pipe-line oil at the rate of 20 bbl. per hour. Total depth is 9,110 ft., in sidetracked hole and pipe is set on bottom. The flow is through perforations at 9,090-9,110 ft. This well is located in the HT&B Survey, Section 55, Abstract 286, 4 miles northeast of Sandy Point production.

Pan American Production Co. 1 Paul Lang, prospective new oil field discovery in DeWitt County, 3 miles northwest of Meyersville and 2 miles northeast of the recent "Holly" field discovery, recovered 2,610 ft. of 33.9°-gravity oil plus 135 ft. of salt water, on drill-stem test at 7,626-31 ft., using ¼-in. chokes. Bottom-hole pressure was 2,900 psi. open and 3,200 psi. shut in. Tool was open 10 minutes. A drill-stem higher in this sand, at 7,585-98 ft., developed 510 psi. working pressure in 11 minutes through ¼-in. chokes, and recovered 45 ft. of gas-cut mud and considerable condensate-cut mud. Casing was set to 7,770 ft. and operators are testing perforations at 7,627-29 ft. This well is located in James Duff League.

The second producer has been completed in the recently opened Gottschalt field, Goliad County, and a third test has spudded. Walter Goldston 1 Mary Meyer, in Dumott Survey, ¾ mile southwest of the discovery well, ran potential gage of 120 bbl. of 34.6°-gravity oil per day through a ⅛-in. choke, with 875 psi. tubing pressure and 1,100 psi. casing pressure, gas-oil ratio of 500. Top of pay zone is 7,683 ft., and is in the top of the Massive Wilcox sand, below the Mackhank sand discovery pay. Production is through perforations at 7,683-89 ft. The 2 Meyer, 933 ft. south of the 1 Meyer, is drilling ahead below 4,000 ft. after setting 10¾-in. surface casing at 1,685 ft.

A new oil-producing area on the north side of the Boling Dome in Fort Bend County has been opened by British-American Oil Producing Co. 1 J. M. Moore, in Charles A. Bettner Survey, Abstract 11, off the north flank of the dome. Total depth is 4,180 ft. The well is flowing from 4 to 5 bbl. of oil per hour, with 225 psi. pressure on tubing and 400 psi. pressure on the casing, through perforations at 3,762-3,769 ft. Now closed in to erect storage. Location for 2 J. M. Moore, 250 ft. to the west, has been made and operations will begin at once.

The 45 new locations reported this week included 9 wildcat starts, 2 each in Matagorda and Wharton counties,, and 1 each in Brazoria, Fort Bend, Liberty, Live Oak and Orange counties. Wildcat completions were 8 dry, 2 each in Live Oak and Matagorda counties and each in Karnes, Liberty, Refugio and Victoria counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Karnes County: Sun Oil Co. 1 Georgia B. Wells et al, in Benino Arocha Sur., 11 mi. E of Stockdale & 3 mi. N of Gillette, dry, TD 5,505 ft.

Liberty County: Miles Prodn. Co. et al A-1 M. P. Hinchliff et al, H&TC RR Sur., Sec. 105, 3½ mi. NW of North Cleveland field prodn., dry, TD 5,589 ft.

Live Oak County: Bridwell Oil Co. 2 H. D. Miller, in L. Arroja Grant, A-42, 4 mi. SE of Lagarto, dry, TD 4,820 ft.

Producers Corp. of Nevada 1 T. M. Brookshire, in J. Poitevent Sur. 1, A-341, 6 mi. SW of Clegg, in extreme SW corner of county, dry, TD 3,504 ft.

Matagorda County: Salt Dome Oil Corp. 1 State of Texas Sec. 172, Matagorda Bay, dry, TD 5,722 ft.

The Texas Co. 1 State of Texas Tract 199, in Matagorda Bay, 4½ mi. NE of Port O'Connor, dry, TD 6,050 ft.

Refugio County: Seaboard Oil Co. of Dela. 2 Power & Woodworth, in Jose Garza & Jose Vidauri Grant, 4½ mi. N of Vidauri, dry, TD 6,720 ft.

Victoria County: Southern Minerals Corp. 1 Marion Stubbs et al, in Rafael Manchola Grant, A-87, on west shore of Pridham Lake, 4 mi. SW of Victoria, dry, TD 5,015 ft.

LA.-ARK.

Lincoln Parish Deep Test Proves Unsuccessful

SHREVEPORT.—Carter Oil Co. 1 Martin Matthews, 22-18n-4w, deep wildcat in Lincoln Parish 3½ miles northwest of Rodessa and Travis Peak gas production in the Simsboro field. was abandoned at 10,531 ft. in the Cotton Valley after weeks of extensive coring and testing. Last core from 10,579-10,531 ft. recovered 50 ft. of shale with sand streaks, and no shows. Operators then ran electrical survey and prepared to plug. The Cotton Valley, topped at 9,050 ft., had several small shows of gas. A drill-stem test from 9,706-16 ft., open 1 hour, produced a slight blow for 20 minutes and recovered the water cushion plus 25 ft. of distillate and gas-cut mud.

On the south edge of the Blue Lake field, Sabine Parish, Thomason, Smith & Turner 1 Giaugue, 27-7n-14w, stopped at 6,020 ft. in the lower Glen Rose to run electrical survey. Cores from 4,980-95 ft. recovered 1 ft. of medium porous lime with oil odor and stain, and 6 ft. of hard, dense lime with pinpoints of oil. A drill-stem test from 4,965-95 ft., open 9 minutes, recovered 2 stands of mud cut with salt water, and 3 stands of salt water with slight oil taste.

In Tensas Parish, C. H. Osmond et al 1 Wilkerson, 15-12n-12e, was drilling ahead at 9,323 ft. in the lower Cretaceous after running electrical log to 9,024 ft. A gas sand was indicated at 8,780-8,804 ft. Cores from 8,780-8,808 ft. recovered sections of fairly porous sand with good distillate odor. A drill-stem test from 8,782-8,800 ft., using ¼-in. chokes and 540 ft. of water cushion, recovered 16 stands of water and mud cut with distillate. Tubing pressure was 240 psi. Bottom-hole flowing pressure was 1,350 psi., increasing to 3,300 psi. when shut in.

In Webster Parish, Hunt Oil Co. 1 A. C. Burns, 16-23n-9w, was drilling below 11,999 ft. in the Smackover. No details were available. Stanolind and Continental's 11,700-ft. test in the shallow Shongaloo field, in 31-23n-9w, was drilling in Cotton Valley at 8,078 ft. It had sample top on the Cotton Valley at 7,648 ft., and the Bodcaw at 8,057 ft.

Continental's 1 Pardee, 30-12n-6w, Natchitoches Parish, was coring below 11,592 ft. fine gray sand with shale streaks.

In Columbia County, Arkansas, McAleser Fuel Co. 1-A W. D. Black, 24-15s-21w, was drilling below 6,408 ft. in the Buckner topped at 6,258 ft. Core reports showed spotted oil stains between 3,727-32 ft. in shaly lime, and additional stains in siltstone to 3,743 ft.

Eleven miles south of the McKamie field, Lafayette County, Stanolind Oil & Gas Co. et al 1 Bodcaw Lumber Co., 29-19s-23w, spudded in for an 11,000-ft. test, using a turbine-driven bit (see The Oil and Gas Journal, June 3). Twenty-inch casing was set to 85 ft.

Carter Oil Co. 1 Riley Pepper, 15-19s-15w, Union County, was drilling in the Travis

Peak below 5,206 ft., and Curtis A. Kinard 1 Scales, 3-18s-17w, was in Cotton Valley below 6,991 ft. Sohio Petroleum Co. 1 Max Schilling, 12-16s-17w, was waiting on workover rig at total depth of 6,193 ft., after recovering salt water and a slight show of dead oil on a drill-stem test of perforations between 2,305-23 ft.

ARKANSAS WILDCAT FAILURES

Jefferson County: F. H. Carpenter 1 A. C. McGregor, NE SE 9-4s-9w, dry, TD 3,216 ft.

Nevada County: W. O. Stevens 1 Gurden, NE SE 2-11s-21w, dry, TD 1,765 ft., Smackover 1,450 ft.

Ouachita County: Jack Carnes 1 S. A. Graves Heirs, NW SW NW 33-13s-18w, dry, TD 2,027 ft.

S. J. Carnes 1 Joe Epperson, NW NW 1-12s-19w, dry, TD 2,700 ft., Smackover 2,591 ft.

J. S. Slack 1 J. Dean, NW NE SE 16-14s-19w, dry, TD 3,601 ft., Nacatoches 1,620 ft., Saratoga 1,846 ft., lower Cretaceous 2,443 ft., Hogg 2,495 ft., Travis Peak 2,645 ft., Cotton Valley 3,430 ft.

Union County: E. G. Bradham 1 Hartze, SE SE NW 17-16s-14w, dry, TD 4,002 ft.

NORTH LOUISIANA WILDCAT FAILURES

Lincoln Parish: Carter Oil Co. 1 Matthews, SE NW 22-18n-4w, dry, TD 10,529 ft., elev. 353 ft.

Sabine Parish: Thomason, Smith & Turner 1 E. Giaugue, NE SE 27-7n-14w, dry, TD 6,020 ft., Massive anhydrite 5,856-58 ft., Rodessa porosity 5,858 ft., elev. 147 ft.

Union Parish: Shell Oil Co., Inc., 1 T. D. Griffin, SW NW SW 31-23n-1e, dry, TD 2,246 ft., Nacatoches 2,132 ft., second Nacatoches 2,182 ft., elev. 181 ft.

ILLINOIS

Washington County Well Gets Silurian Pay

MATTOON.—Prospects are good for Silurian production in McKinley pool in southern Washington County at W. C. McBride 1 Aloys Hunleth, SE NE NW 29-3s-4w. Operator has set casing through the Silurian, called at 2,255-81 ft., after drilling to 3,983 ft. Recovery on a 1-hour drill-stem test of the Silurian was 1,140 ft. of oil with no water. Present production in the field is from the Benoist in upper Mississippian series and from the Devonian.

In Madison County, J. L. Neary 1 Charles Henke, SW SW SW 17-6n-6w, may open a new Pennsylvania sand pool. Well swabbed 50 bbl. of oil in 8 hours from sand at 525-35 ft. and is shut in for tank space. This new well is about 3 miles south of Staunton, Ill.

In Franklin County, Paul Mosebach 1 Eurgil, SW SE SE 35-5s-1e, is cleaning out and testing Aux Vases at 2,586-2,637 ft. Well is reported to have had a fillup of 1,200 ft. of oil after a 100-qt. shot. On an earlier test of the O'Hara at 2,764-68 ft., well swabbed 20 bbl. of oil per day.

ILLINOIS SUCCESSFUL WILDCATS

Edwards County: O. Weston 1 V. Hosewinkle, NW NW NW 22-1n-14w, IP 33 bbl., Lower O'Hara 2,924-29 ft., TD 2,977 ft.

Gallatin County: Carter Oil Co. 2 York, SE SE SW 33-7s-8e, new pay in Biehl sand, 1,320-24 ft., TD 1,353 ft.

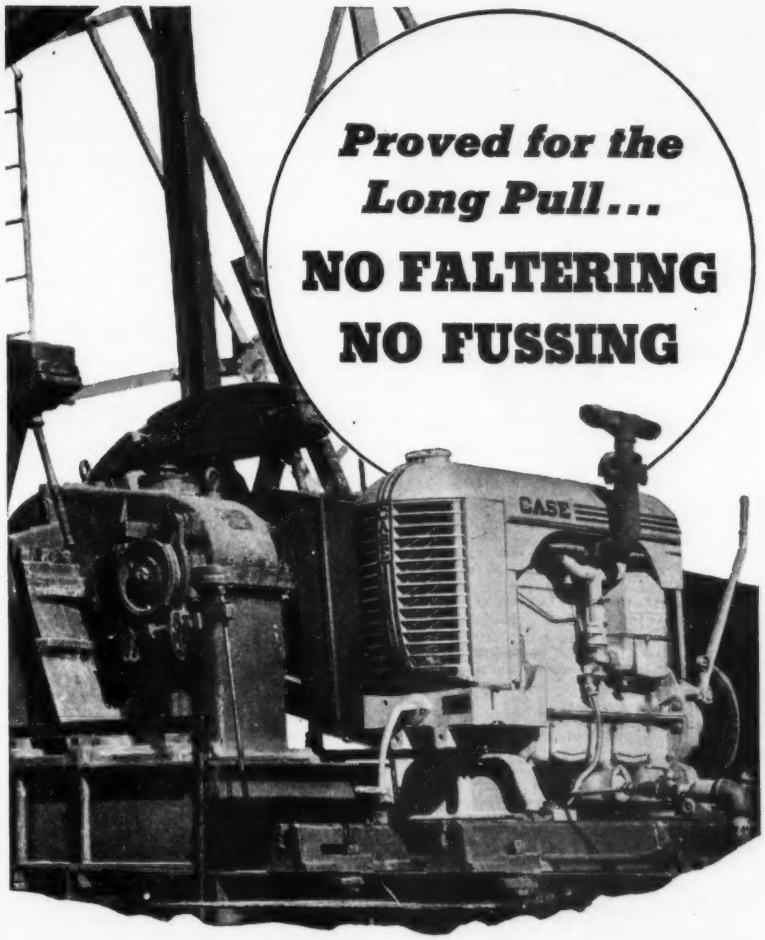
ILLINOIS WILDCAT FAILURES

Cumberland County: Craig Dillman 1 Sedgwick, SW SW SW 4-9n-10e, dry, TD 640 ft.

Wayne County: Hed Oil Co. 1 N. Clutter, SE NE SW 17-1n-7e, dry, TD 3,235 ft.

Marion County: Perrine & Perrine 1 I. Halfacre, NE SE NW 34-1n-4e, dry, TD 3,000 ft.

Montgomery County: T. J. Penticost 1 G.



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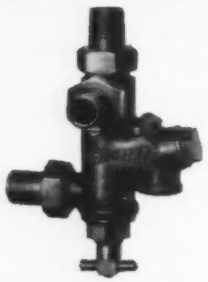

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Pope, NW NW NW 28-9n-3w, dry, TD 2,882 ft.

Bond County: P. Doran 1 Smith, SW SW NE 13-4n-3w, dry, TD 1,143 ft.

Madison County: G. T. Loper 1 H. Schmidt, NE NE NW 1-4n-6w, dry, TD 843 ft.

White County: Calvert & Willis 1 Stocke, SW NE SW 29-4s-9e, dry, TD 3,429 ft.

Hamilton County: Kingwood Oil Co. 1 L. E. Hungate, NE NE SW 16-6s-5e, dry, TD 3,443 ft.

OKLAHOMA

Payne County Wildcat Has Good Show

DEARDORF OIL CORP., had a promising show at 1 Howell, SW NE SE 14-17n-3e, Payne County, northeast of Sporn pool. A drill-stem test of Red Fork sand, 3,904-38 ft., had gas in 30 seconds with flow increasing rapidly for the remainder of the 4-minute test to reach an estimated rate of 25,000,000 cu. ft. per day. Operator cored from 3,938-53 ft. with top of Bartlesville called at 3,942½ ft. A drill-stem test at 3,938-53 ft. had gas in 1 minute and oil flowing in 55 minutes, estimated at 50 bbl. per hour. At the end of 55 minutes, the well was flowing some salt water and tool was closed An electric log indicated the water at the basal part of the sand so operator will set casing through sand and attempt to complete the well in the Bartlesville through perforations.

Good wells continue for Northeast Lindsay pool of McClain County as Sinclair Prairie Oil Co. tests at 1 David Ethridge, NE SW SE 24-5n-4w on the north side of the pool. Tubing was run to 10,522 ft., 10 ft. off bottom, and after flowing to pits, the oil was turned into tanks to flow 457 bbl. of 41.6°-gravity oil in 7 hours through ¾-in. choke.

In northern Caddo County, Denver Producing & Refining Co. continues drilling at the deep test, 1 School Land, C SE SW 16-10n-9w, with bit now below 16,246 ft.

Pure Oil Co., Skelly Oil Co., and Tide Water Associated Oil Co. 1 Taute, C SW SE 34-10n-25w, Beckham County, is location for a 13,000-ft. test of the area just north of Erick gas field.

In Pottawatomie County, J. C. Buell 1 Blankston, E½ SE NW 12-6n-3e, has been completed in the Viola at 4,259-95 ft. for an initial production of 319 bbl. of 38.7°-gravity oil per day.

OKLAHOMA SUCCESSFUL WILDCATS

Hughes County: Grabon 1 Hundley, SW NW NW 29-5n-10e, gaged 4,000,000 cu. ft. of gas per day from sand at 1,756-65 ft., TD.

Murray County: Sohio 1 Kirby, NW NW NW 19-1n-3e, pumped 8 bbl. of 17.8°-gravity oil per day from basal Oil Creek at 1,920-35 ft., TD 2,223 ft.

Pottawatomie County: Buell 1 Bankston, E/2 SE NW 12-6n-3e, flowed 319 bbl. of 38.7°-gravity oil per day from Viola at 4,259-95 ft., TD.

OKLAHOMA WILDCAT FAILURES

Cotton County: Doyle 1 St. John, SW SW SE SE 32-2s-11w, dry, TD 1,703 ft., sand 1,076-80 ft., 1,423-42 ft. and 1,658-84 ft.

Ford 1 Jones, NW NW SE 24-4s-10w, dry, TD 2,115 ft., Megargel 1,580-90 ft.

Ross 1 Kirkpatrick, NW NW SE 11-4s-13w, dry, TD 2,510 ft., basal Megargel 2,405 ft.

Hughes County: Oliphant 1 Nolan, SW SE SE 34-8n-10e, dry, TD 2,568 ft., Bartlesville 1,820 ft., brown lime 2,160 ft., 2,190 ft. and 2,220 ft., Booch 2,306 ft., coal 2,390 ft., lower Booch 2,400 ft., Hartshorne 2,554 ft.

Lincoln County: Harper-Turner 1 Neighbors, NW NE NW 34-12n-4e, dry, TD 5,615 ft., Woodford 5,250 ft., Hunton 5,330 ft., Viola 5,433 ft., dense 5,477 ft., dolomite 5,500 ft., sandy dolomite 5,514 ft., Wilcox 5,520 ft., second Wilcox 5,566 ft.

Arrow 1 Gravitt, SW SW NE 27-13n-6e, dry, TD 3,665 ft., Hogshooter 1,732 ft., Layton 1,820 ft., Checkerboard 2,122 ft., Oswego 2,945 ft., Prue 3,002 ft., Verdigris 3,135 ft., Skinner 3,142 ft., lower Skinner 3,195 ft., Red Fork 3,393 ft., Inola 3,520 ft., Bartlesville 3,545 ft., brown lime 3,657 ft.

Wood 1 Hellman, SW SW NE 24-14n-3e, dry, TD 4,960 ft., conglomerate 3,278 ft., Oswego 3,920 ft., no Prue, Verdigris 4,050 ft., no Skinner, Red Fork 4,205 ft., Mayes 4,590 ft., Woodford 4,788 ft., Misener 4,846 ft., Hunton 4,858 ft., Sylvan 4,870 ft.

Blackwell 1 Chloe, NW NW SE 33-17n-2e, dry, TD 5,070 ft., Hogshooter 3,412 ft., Checkerboard 3,785 ft., Oswego 4,140 ft., Checkerboard 4,390 ft., Red Fork 4,434 ft., Mississippi lime 4,590 ft., Woodford 4,640 ft., Hunton 4,670 ft., Sylvan 4,755 ft., Viola 4,848 ft., Wilcox 4,928 ft., second Wilcox 5,050 ft.

McClain County: Cities Service 1 Pugh, SE SE SE 21-5n-3w, dry, TD 8,450 ft., no tops reported.

Murray County: Lausen 1-A Tinney, SE NW NW NW 14-2s-3e, dry, TD 1,033 ft., Arbuckle 1,030 ft.

Stephens County: Davis 1 Bullard, SW NE SW 34-2s-6w, dry, TD 2,396 ft., Canyon 1,225 ft.

Ohio 1 Reichman, SW NE SW 30-2n-5w, dry, TD 11,205 ft., no tops reported.

KANSAS

Kiowa County Wildcat Makes Good Oil Show

A RANK Kiowa County wildcat pumped 300 bbl. in 24 hours. The well, Drillers Gas Co. 1 Lorimor, C SE NW 20-30s-20w, was drilled to 5,278 ft. and cased to 5,274 ft. Water resulted from the first perforations at 5,202-10 ft. but oil increased with perforations made at the top of the Mississippian at 5,126-54 ft. Plug was set at 5,172 ft. and additional holes made in the upper section for a total of 107 above the plug. After treatment with 3,000 gal. of acid, the well pumped 300 bbl. in 24 hours. Tanks are being installed for potential test. The well is located about 9 miles west of the Alford gas pool.

Also in Kiowa County, J. M. Huber Corp. 1 Cullins, NW SE 20-28s-17w, is showing as an oil and gas producer. In a 35-minute drill-stem test of the Mississippian at 4,836-42 ft., recovery was 100 ft. of oil and oil-cut mud and gas, estimated at 2,000,000 cu. ft. daily.

Harry Gore has completed 1 Ruder, SW SW NE 14-9s-19w, Rooks County, as a maximum well from a total depth of 3,462 ft. in the Arbuckle to open the Chandler pool.

Stanolind Oil & Gas Co. has completed the Seward County wildcat, 1 Wheatley, C NE SW 23-33s-31w, in the Marmaton at 5,095-5,100 ft. for a potential of 132 bbl. of oil and 88 bbl. of water per day. Well was carried to 7,340 ft. in the Arbuckle and casing set at 5,980 ft. for a test of the Mississippian before decision was made to complete in the Marmaton.

In Stafford County, Phillips Petroleum Co. has completed 1 Stafford, NW NW SW 33-21s-13w, in the Arbuckle from a total depth of 3,762 ft. with a rating of 3,096 bbl. per day by the echometer. The well is a south offset to the Hufford pool opener, completed in April with an initial production of 368 bbl. per day.

Butler County is credited with 11 new locations out of a total of 86 reported for the week. Rooks County had nine, Ellis had eight, and Stafford had seven.

KANSAS SUCCESSFUL WILDCAT

Saline County: Deep Rock Oil Co. 1 James, SW SW SE 8-16s-1w, pumped 60 bbl. of

oil per day from Mississippian at 2,674-90 ft., TD 2,696 ft.

KANSAS WILDCAT FAILURES

Barber County: Bishop Oil Co. 1 Davis, C NW 6-34s-14w, dry, TD 5,568 ft., Heebner 4,040 ft., Dodge 4,091 ft., Dodge sand 4,101 ft., Lansing 4,248 ft., Mississippian 4,853 ft., chat 5,174 ft., Misener 5,220 ft., Viola 5,223 ft., Simpson dolomite 5,362 ft., Simpson sand 5,394 ft., Arbuckle 5,458 ft.

Butler County: Shell Oil Co. 1 Taliaferro, C SE 5-26s-6e, dry, TD 2,765 ft., stratigraphic test, no tops reported.

Cowley County: Wakefield & El Dorado Refining et al 1 Harris, SE SE NE 6-32s-6e, dry, TD 3,123 ft., Layton 2,339 ft., Kansas City 2,412 ft., Bartlesville 2,980 ft., Bartlesville sand 3,048 ft., Mississippian 3,118 ft.

Ellis County: Virginia Drilling 1 Sack, NE NE NE 26-13s-19w, dry, TD 3,734 ft., Topeka 3,075 ft., Heebner 3,313 ft., Lansing 3,375 ft., conglomerate 3,649 ft., Arbuckle 3,703 ft.

Greenwood County: Ketting & Buckler 1 Foltzest, SW NW NE 32-25s-12e, dry, TD 1,780 ft., Mississippian 1,755 ft.

Marion County: Stormfelz et al 1 Larkin, NE NW SE 34-19s-5e, dry, TD 2,602 ft., Kansas City 1,665 ft., lime 2,130 ft., Viola 2,350 ft., Simpson 2,475 ft., Simpson sand 2,500 ft., Arbuckle 2,550 ft.

Reno County: Plains Exploration 1 Eales, NE NE SW 2-24s-5w, dry, TD 3,967 ft., Fort Riley 900 ft., Lansing 2,682 ft., Mississippian 3,398 ft., Kinderhook 3,601 ft., Misener 3,724 ft., Maquoketa 3,753 ft., Viola 3,826 ft., Simpson sand 3,848 ft., Arbuckle 3,937 ft.

Rice County: Holl & Allen 1 Binger, NE NE SW 33-18s-10w, dry, TD 3,328 ft., anhydrite 470 ft., Lansing 2,932 ft., conglomerate 3,274 ft., Arbuckle 3,296 ft.

Rooks County: Seaney, Peel & Phillips Petroleum 1 Reed, NW SE NW 23-7s-17w, dry, TD 3,350 ft., Topeka 2,631 ft., Heebner 2,843 ft., Dodge 2,862 ft., Lansing 2,881 ft., basal Kansas City 3,132 ft., conglomerate 3,231 ft., weathered Arbuckle 3,274 ft., solid Arbuckle 3,304 ft.

Bridgeport Oil Co. 1 Neu "A," SW SW SE 18-9s-18w, dry, TD 3,671 ft., Heebner 3,301 ft., Toronto 3,312 ft., Lansing 3,336 ft., conglomerate 3,573 ft., Arbuckle 3,658 ft.

Russell County: Stearns Petroleum Co. et al 1 Foster, SE SE SE 11-12s-15w, dry, TD 3,295 ft., Dodge 2,908 ft., Lansing 2,949 ft., conglomerate 3,240 ft., Arbuckle 3,240 ft., granite wash 3,285 ft., granite 3,290 ft.

Sedgwick County: J. P. Gaty 1 Meyers, NE SE NE 8-26s-2e, dry, TD 3,048 ft., Burgess sand 2,932 ft., Mississippian 2,955 ft.

Sumner County: Bridgeport Oil Co. 1 Fox "D," C N/2 NW SE 26-33s-2w, dry, TD 4,566 ft., Stalnaker 3,006 ft., Kansas City 3,344 ft., Mississippian 3,998 ft., Kinderhook 4,362 ft., Simpson sand 4,416 ft., Arbuckle 4,537 ft.

OHIO, KENTUCKY

Bladensburg Pool Is Extended by New Well

COLUMBUS.—C. A. Davis et al 1 Bird Moran, Section 6, Jackson Township, Knox County, was good for 100 bbl. in the first 24 hours after shot. This producer along with the 1 Van Winkle, ⅛ mile to the south, extends the Bladensburg pool nearly a mile to the west and assures a heavy concentration of drilling.

A number of good completions was reported from the Sego pool in Madison Township, Perry County. The Preston Oil 3 E. A. Forsythe, Section 27, flowed 110 bbl. the first day after a 90-qt. shot. Clinton sand was found at 3,295-3,330 ft. The Mid East 3 Francis Love, Section 22, made 29 bbl. natural and 102 bbl. after shot. The sand came in at 3,358-3,400 ft. The same company has drilled in a good well on Chas. Hammer in Section 28, but the production after shot has not yet been reported.

Wasson and Co. 1 John Winters, Section 8, Salt Creek Township, Muskingum County, had an oil showing in the Clinton that was shot with 80 qt. After shot, the well is estimated to have flowed and swabbed 60 bbl. Clinton sand was logged at 4,203-40 ft. and the Medina, which was dry, at 4,300-02 ft.

The Wittmer Co. reached the Oriskany formation at 3,562 ft. in its deep test on Wm. O. Wortman, Section 24, Bristol Township, Morgan County, but the sand was missing and no shows were reported.

Thirty-five locations from 14 counties were reported for the week. Perry County again led with 6 and was followed by Cuyahoga with 5, Muskingum and Washington with 4, and Athens and Meigs with 3 each.

Lancaster field led in completions with 10 out of a total of 31.

OHIO WILDCAT FAILURES

Athens County, Trimble Township: John Morrow et al 2-C Republic Coal Co.,

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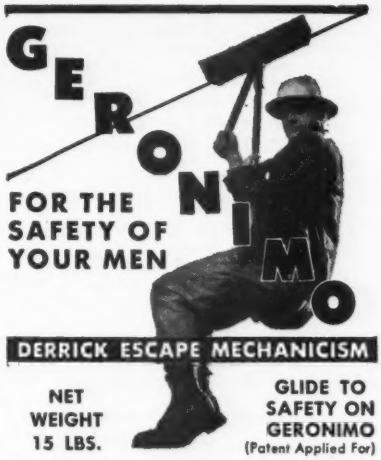

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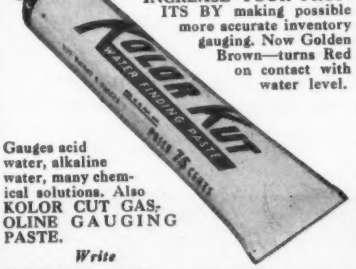

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Sec. 23, Clinton 2,605-52 ft., Medina 3,718-25 ft., TD 3,735 ft.

Lorain County, Brookside Township: G. B. Harmon et al 1 Rudy Blaha, Lot 8, Clinton 2,206-07 ft., 2,210-19 ft., TD 2,354 ft.

WESTERN KENTUCKY

OWENSBORO.—In the recently discovered Morganfield pool in Union County, Sun Oil Co. 1 W. A. Anderson, 23-O-19, pumped 218 bbl. per day from Waltersburg sand at 1,784-1,801 ft. with good oil saturated Pennsylvanian sand at 1,378-1,412 ft. not yet tested. Production in the pool opener was from the Pennsylvanian.

In McLean County near Island pool, Benedum-Trees Oil Co. and T. Galey 1 George McManama, NW NW SW 22-L-28, recovered a small quantity of free oil plus 20 ft. of oil-cut mud in a 1-hour drill-stem test of Bethel sand at 1,872-81 ft. Casing has been set to 1,871 ft. for further test of the Bethel.

On the west side of South Livermore pool in McLean County, J. C. Ellis and C. Morrison 13 Stephen Heirs, 6-L-29, has been completed in the McClosky at 1,639-43 ft. and 1,658-64 ft. for an estimated initial production of 50 bbl. per day.

INDIANA

EVANSVILLE.—In the area just south of Owensville in the southern part of Gibson County, C. E. Skiles has a pool opener at 1 Columbus Smith, NW NW NW 13-3s-12w. Estimated production is about 200 bbl. per day from Waltersburg sand at 1,811-25 ft. and operator is installing pump for further test. The hole was bottomed at 2,636 ft.

J. L. Peek has given the Union-Bowman area an extension to the north at 1 Kinman & Dillin, SE NE SW 15-1n-9w, Pike County. Production is indicated for Waltersburg (Rumble) sand at 960-77 ft. Well is reported to have had a fill-up of 500 ft. after a 30-qt. shot.

In the western part of Gibson County and about ½ mile northeast of the pool opener, Olen D. Sharp 1 Berry, Ralph Halbert and Fred Heldt 1 J. B. Lennert, SW SE SW 12-2s-13w, is pumping 30 bbl. per hour from Waltersburg sand at 1,902-57 ft. Since production to the south of the discovery well was found at 2 Berry the good pay indicated for the area north of the opener has given the new pool added importance.

INDIANA SUCCESSFUL WILDCAT

Gibson County: Ernest Zink 1 G. F. Maier, NW SW SE 12-4s-11w, IP 20 bbl., McClosky, 2,382-86 ft., TD 2,392 ft. Discovery well of St. James pool.

CALIFORNIA

Salinas Valley Results Looking Better

LOS ANGELES.—The outlook for the San Ardo area of Monterey County continues to brighten. Jergins Oil Co. and North American Consolidated Oil Co. started their Salinas Valley play with the 1 Orradre, 12-23s-10e, completed several weeks ago for approximately 7,500,000 cu. ft. of gas. The second well, the 15-12 Orradre, in the same section, went through the gas sand into an oil sand where it was completed on pump for 250 bbl. daily, and is now producing about 300 bbl. daily. The combination's third wildcat venture, the 73-11 Ferrini, 11-23s-10e, has been bottomed at 2,392 ft. with what appears to be three productive intervals. The first zone, about 200 ft. of oil sand, is at 1,948-2,148 ft., and is a heavy oil horizon with a highly productive gas cap.

The second zone at 2,230-70 ft., is a gas sand which flowed at the rate of 7,500,000 cu. ft. on test. Same believe this zone might also yield a high gravity oil. The third zone is a fractured schist at 2,373-82 ft. This appears to carry oil in the fractures, but it will not be tested at this time. Instead, the well will be plugged back to 2,270 ft. where a series of tests will be run.

Up to now, production in the Salinas Valley has been small and spotty. Although one of the most prospected areas in the state, the first commercial oil was found only 8 months ago by the Texas Co. with an 85-bbl. well. Since then, Texas has drilled two additional wells in the 50-75-bbl. class. However, Texaco now plans to put down three additional test wells.

Richfield Oil Corp., after successfully completing two discovery wells in the Cuyama Valley of Santa Barbara and San Luis Obispo counties, is proceeding with a rapid development program in the area. Currently the company is drilling four additional wells and grading locations for three more.

The A-18-5, offset to the first discovery well, A-28-5 Russell, is repairing equipment at total depth of 3,210 ft. The Anderson-Colgrove 26-30, in 30-11n-27w, and west of the 2 Anderson-Colgrove discovery, is moving in equipment preparatory to commencing drilling operations. The B-11-8 Russell, 8-10n-27w, is drilling below 2,700 ft.; the 1 Cebrian Estate, first venture in 23-11n-28w, is below 300 ft.; while the 58-30 Anderson-Norris, 30-11n-27w, the A-17-5 Russell, 5-10-27w, and the B-31-8 Russell, 8-10n-27w, are grading locations.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Wheeler Ridge area: Richfield Oil Corp. 61-29 Coal Canyon, 29-11n-20w, pumped 80 bbl. daily, gravity 23.4°, water cut 12.0 per cent, 267 ft. perf. liner landed 966 ft., elev. 1,141 ft., TD 1,218 ft.

Monterey County, San Ardo area: Jergins Oil Co. and North American Consol. Oil Co. 15-21 Orradre, 12-23s-10e, pumped

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250 bbl. daily, gravity 13.0°, water cut 0.1 per cent, TD 2,157 ft.

San Luis Obispo County, Cuyama Valley area: Richfield Oil Corp. 2 Colgrove, 30-11n-27w, flowed 4,000 bbl. daily, gravity 33.0°, no water cut, perf. 2,800-3,019 ft., TD 3,022 ft.

Santa Barbara County, Cuyama Valley area: Richfield Oil Corp. A-28-5 Russell, 5-10n-27w, flowed 508 bbl. daily, gravity 38.3°, water cut 2.0 per cent, 48/64-in. choke, producing zone 2,970-3,360 ft., elev. 2,099 ft., TD 4,218 ft.

Solana County, Rio Vista area: D. D. Feldman 1 Gardiner, 25-4n-3e, IP 3,013,000 cu. ft. gas, perf. 4,595-98 ft., 4,501-11 ft., elev. 10 ft., TD 4,655 ft.

Ventura County, Ojai area: Richfield Oil Corp. 56 Ojai, 14-4n-22w, pumped 258 bbl. daily, gravity 19.6°, water cut 2.3 per cent, elev. 1,968 ft., TD 3,853 ft.

CALIFORNIA WILDCAT FAILURES

Glenn County, Afton area: Richfield Oil Corp. 1 Afton Community, 2-18n-1w, dry, elev. 85 ft., TD 2,850 ft.

Kern County, Blackwell's Corner area: Superior Oil Co. 1 O.L.C., 27-27s-19e, dry, elev. unknown, TD 2,722 ft.

Solano County, Kirby Hills area: Shell Oil Co., Inc. 1 Harper, 14-4n-1w, dry, elev. 18 ft., TD 7,500 ft.

PERMIAN BASIN

Wildcat Near Benedum Well Recovers Gas, Water

MIDLAND.—Oil Carriers, Inc., 1 Max Pray-State, 3 miles west and slightly north of the Benedum discovery, and first of several wildcats now drilling to reach the Ellenburger since that time, ran its first drill-stem test of the Ellenburger and recovered water and some gas. Some observers believed the water might not be from the formation. While Slick-Urschel and Plymouth Oil Co.'s 1 Alford had gas in the top of the Ellenburger, the 1 Max Pray-State did not test from the top, at 11,535 ft., to 11,600 ft., but ran the test from 11,600-11,714 ft., total depth. The tool was open 2 hours, and a good blow of air was produced throughout. Recovery was 1,800 ft. of the 2,120 ft. of water cushion used, plus 720 ft. of gas-cut drilling mud and 420 ft. of salt water cut with mud and a slight show of gas. It was to drill ahead another 100 ft. for a second test.

Offsets to the Benedum discovery were drilling ahead but none was in the Ellenburger. Slick-Urschel 1 Standifer was below 10,728 ft. in Silurian lime and shale, while the same company's 1 Gordon was below 9,790 ft. in the Pennsylvanian. Plymouth Oil Co. 1 Wallace was drilling at 9,778 ft., and its 1 Taylor-Sadler was below 9,624 ft.

Two and one-half miles northwest of Benedum, Republic Natural Gas Co. 1-E-A Rosa Halff Barnett, Section 40, Block Y, TCRR Survey, ran a 2¾-hour drill-stem test from 9,664-9,744 ft., recovering 960 ft. of water blanket cut with gas a very small amount of oil, plus 45 ft. of gas-cut drilling mud. Drilling continued. Farther northwest, Humble 1 Barnett was drilling at 10,728 ft. in lime and shale of unannounced age. In western Upton County, Wilshire Oil Co. 1 McElroy Ranch was drilling in lime and chert at 12,148 ft.

Testing continued at McAlester Fuel Co. 1 M. M. Fisher Estate, Section 4, Block A-26, Andrews County Devonian discovery, northeast of Shafter Lake. The well was placed on gas lift and in the first 14 hours flowed 77 bbl. of fluid, being about 20 per cent oil. Water and sediment started decreasing and in the following 11 hours, it flowed 30 bbl. of fluid, cut 5 per cent with sediment and water. Total depth was 11,297 ft., plugged back to 11,184 ft.

In Sterling County, Anderson Prichard Oil Corp. and Vickers Petroleum Co., Inc., 2 Marvin Frances Foster confirmed production from the Wichita Albany. After acid treatment from 4,201-39 ft. with 1,000 gal., the well cleaned into pits for 2 hours then gaged 143 bbl. of oil in 5 hours. Size of choke used was not immediately determined.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Ector County: Amerada Petroleum Corp. 1 Hattie E. Connell "A," Sec. 25, Blk. B-16, PSL Sur., 2 mi. S Judkins, dry, TD 7,687 ft., anhydrite 880 ft., salt 900 ft., Yates 2,200 ft., San Andres 3,515-4,477 ft., Woodford 7,306 ft., Devonian 7,516 ft., elev. 2,859 ft.

Pecos County: R. L. Wheelock, Jr., 1 D. B. Gregg, Sec. 30, Blk. 140, T&St.L. Sur., 13 mi. NE Fort Stockton, dry, TD 1,395 ft., show gas 1,200 ft., elev. 2,546 ft.

Runnels County: Homer Easterwood 1 H. Giesecke, Giesecke 3rd Subd., 15 mi. SE Ballinger, dry, TD 2,870 ft.

Sutton County: Dunn, Ownby & Smith 1 Cauthome, Sec. 17, CCSD&RGNG Sur., 19 mi. S Sonora, dry, TD 1,100 ft. in shale, slight show black oil 950 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Stanolind Oil & Gas Co. and C. L. Norsworthy, Jr., of Dallas, staked location for a 12,000-ft. Ellenburger wildcat 2 miles south of Nadine, and about 6 miles east of the Monument field of eastern Lea County. The new project is the 1-W State, SW SE 2-20s-38e.

Reports on Lea County exploration work included Texas Pacific Coal & Oil Co. 39-A State, Account 2, in 9-22s-36e, drilling below 10,195 ft. in lime. Gulf Oil Corp. 5 Graham-State "F," 36-19s-36e, drilling below 9,180 ft. in lime. Gulf 1 Saltmount, Simpson test in 21-23s-37e, topped Devonian at 7,315 ft., and was drilling below 8,401 ft. Ralph Lowe 1 Skelly-State, 22-12s-34e, was nearing contract depth at 4,490 ft. in lime, with no shows reported.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Eddy County: DeKalb Agricultural Ass'n. 1 Tom Bogle, NE SE 15-16s-26e, 5 mi. N Artesia, dry, TD 5,506 ft., Glorietta 2,130 ft., Drinkard sand 3,511 ft., Abo 4,224 ft., Hueco 5,365 ft., elev. 3,333 ft.

LEGAL

CALL FOR BIDS. To sell royalty oil accruing to the United States. Sealed bids, in duplicate, will be received in the office of the Director of the Geological Survey, Room 5224 Federal Works Agency Building, Washington 25, D. C., on or before noon, d.s.t., July 13, 1948, and publicly opened at 2:00 p.m., d.s.t., on that day, for the sale of certain royalty crude oil accruing to the United States from Federal lands in the Elk Basin field, Montana and Wyoming, and the Cat Creek field, Montana. No bid received after the time fixed herein for submitting bids will be considered. Contracts for the royalty oil will be effective the first day of the calendar month following execution by the Secretary of the Interior and will be for a term ending January 1, 1950, for the Elk Basin royalty oil and a term of 3 years for the Cat Creek royalty oil. The current monthly royalty oil accruals offered for sale under the two items are approximately as follows: 3300 barrels from the Madison formation of the Elk Basin field, and 2,400 barrels from the Cat Creek field. Specifications on the quantities of crude oil offered for sale, the form of bids, the form of contract, and the conditions with respect to bond requirements, deliveries, volume measurements, gravity determinations, and other details relating to the call for bids may be obtained from the Director, Geological Survey, U. S. Department of the Interior, Washington 25, D. C., or the Oil and Gas Supervisor, U. S. Geological Survey, P. O. Box 400 (305 Federal Building), Casper, Wyoming. Sealed bids must be submitted to the Director of the Geological Survey, U. S. Department of the Interior, Washington 25, D. C., pursuant to the specifications, the envelope to be marked plainly "Bid on Royalty Oil, not to be opened before 2:00 p.m., d.s.t., July 13, 1948." Maston G. White, Acting Assistant Secretary of the Interior.

North Cowden

(Continued from page 55)

out the field to carry gas to wells for injection into the Grayburg formation.

The North Cowden plant, with the new facilities to be installed, will have sufficient capacity to process 125,000,000 cu. ft. of wet gas daily and to inject a maximum daily volume of 80,000,000 cu. ft. of residue gas. It is tentatively planned that the expansion will be along the following course:

All of the present plant, except the gasoline stabilizer, will be utilized, with the raw gasoline from the still going to the fractionation system of the new plant for final processing. During the initial period of operation from 1950 through about 1953, the existing plant will process at low pressure the gas not needed for injection, and this residue gas will be sold. With such a gas load, the plant can effect product recoveries comparable to those for which the new plant is designed.

Beginning in 1954, the present plant will process enough gas to hold the load on the new plant down to 100,000,000 cu. ft. per day. As the injection load increases it will be necessary to deliver some of the low-pressure residue gas to the suction of the injection compressors in the new plant. This will be accomplished by utilizing compressors now available in the Cities Service plant. All existing compressors will be used by changing compressor cylinders and header arrangement, and in addition, it will be necessary to add one additional 600-hp. compressor. After 1957, when it is expected that the peak gas production will have passed, the Cities Service plant will be shut down and salvaged.

The new plant design (tentatively) is based on recovering 30 per cent of the available propane, 90 per cent of the available butanes, and 100 per cent of the available pentanes and heavier in the gas. Facilities are also included for sweetening all gas processed by amine treatment, and for dehydrating injection gas.

The estimated cost of the new investments in equipment and construction for the project is approximately $10,000,000, and final plans for the expanded plant, additional facilities and equipment are now in preparation. Stearns-Roger Manufacturing Co., Denver, has the contract for the new construction. The new plant, it is estimated, will require about 100 employes in its operation.

Cities Service will continue to operate the present plant. Stanolind will become the plant operator later when the new construction work is complete, which probably will not be until after January 1, 1950.

STATISTICS and T

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JUNE 26, 1948

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1948				
	Comp.	Oil	Gas	Dry	Footage	1948	1947	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	26	13	0	*13	32,643	767	684	0	0	0	0	0	0	0	0	0	0
Pennsylvania	50	22	3	†25	81,000	1,309	1,368	0	0	0	0	0	0	0	9	13	22
West Virginia	12	5	6	1	30,213	365	382	0	0	1	0	1	3	0	27	31	61
Ohio	31	13	9	9	91,049	642	612	0	0	0	2	2	2	0	8	16	26
Indiana	16	6	1	9	33,987	448	285	1	0	0	0	1	11	0	1	18	30
Kentucky	16	4	0	12	23,981	317	288	0	0	0	0	0	4	0	0	8	12
Illinois	57	35	0	22	146,977	1,026	919	2	0	0	8	10	22	0	1	145	168
Michigan	27	10	4	13	54,372	354	362	0	0	0	7	7	9	0	6	125	140
Kansas	83	44	9	30	269,001	1,424	1,198	1	0	0	13	14	24	0	4	192	220
Neb., Mo., Iowa	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1
Oklahoma	83	45	4	‡34	279,219	1,923	1,963	2	0	1	12	15	64	7	15	304	390
Texas	221	138	10	73	920,688	5,411	4,132	1	0	0	35	36	147	15	50	947	1,159
North Central (Dist. 7-B & 9)	44	23	1	20	113,406	1,660	1,298	1	0	0	7	8	56	0	9	324	389
West (Dist. 7-C & 8)	73	57	0	16	308,403	1,462	998	0	0	0	4	4	26	0	2	98	126
Panhandle (Dist. 10)	11	8	2	1	33,698	292	203	0	0	0	0	0	0	0	1	6	7
Eastern (Dist. 5 & 6)	10	4	0	6	57,078	252	235	0	0	0	5	5	5	2	0	60	67
Gulf Coast (Dist. 2 & 3)	38	17	6	15	211,597	865	750	0	0	0	8	8	37	11	10	214	272
Southwest (Dist. 1 & 4)	45	29	1	15	196,506	880	648	0	0	0	11	11	23	2	28	245	298
Louisiana	39	26	3	10	187,091	1,028	600	1	1	0	4	6	18	12	2	101	133
Northern	25	17	2	6	65,155	682	313	0	0	0	3	3	1	1	0	49	51
Southern	14	9	1	4	121,936	346	287	1	1	0	1	3	17	11	2	52	82
Arkansas	11	2	1	8	36,559	143	127	0	0	0	6	6	3	0	0	43	46
Mississippi	3	2	0	1	26,156	187	219	0	0	0	0	0	2	0	3	40	45
Southeastern States	1	0	0	1	4,413	22	22	0	0	0	1	1	0	0	0	20	20
Montana	10	8	0	2	28,822	124	108	0	0	0	1	1	2	0	0	8	10
Wyoming	10	8	0	2	38,574	210	100	0	0	0	1	1	13	0	1	22	36
Colorado-Utah	3	2	0	1	18,211	117	89	0	0	0	1	1	0	0	1	19	20
New Mexico	10	7	0	3	40,667	297	251	0	0	0	2	2	4	1	1	22	28
California	44	39	1	4	162,838	1,395	972	5	0	1	3	9	43	0	1	141	185
Total United States	753	429	51	273	2,506,461	17,511	14,683	13	1	3	96	113	371	35	130	2,216	2,752
Total previous week	818	477	60	281	2,762,157	16,758	14,029	21	3	6	91	121	358	34	127	2,120	2,639
Total June 28, 1947	654	365	65	224	2,140,941			14	1	5	80	100	314	40	88	1,828	2,270

Service wells included: *13, †23, ‡2.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.36	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT, WEEK ENDED JUNE 19

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	899	2,250	353	1,197	1,601	25,385	7,086	12,079	9,601
Appalachian:									
District 1	107	321	49	83	85	2,066	354	422	322
District 2	58	234	10	28	80	949	112	116	187
Ind., Ill., Ky.	864	3,320	395	772	1,090	21,304	3,246	5,500	4,632
Okla., Kans., Mo.	442	1,551	94	637	467	8,876	1,011	3,390	1,941
Inland Texas	244	1,112	83	181	398	3,249	688	500	839
Texas Gulf Coast	1,398	4,365	674	2,047	1,825	16,202	1,963	6,288	5,515
La. Gulf Coast	430	1,306	329	724	497	4,920	1,413	3,028	1,433
N. La. and Ark.	85	204	62	95	128	1,968	531	417	273
Rocky Mountain:									
New Mexico	13	41	7	11	26	100	25	32	30
Other Rocky Mtn.	153	457	25	182	206	3,032	172	864	962
California	873	2,487	68	801	2,560	16,552	974	11,147	33,003
June 19, 1948	5,566	17,648	2,149	6,758	8,963	104,603	17,575	43,783	58,728
June 12, 1948	5,592	17,928	2,270	7,143	8,967	105,849	16,897	42,288	57,481
June 21, 1947	5,076	15,760	2,116	5,882	8,530	90,942	14,224	38,469	49,001

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 222,321,000 bbl. as of June 19—up 763,000 bbl. One year ago 235,660,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.	
East Texas	$2.65
Kettleman Hills, California*	2.14
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.25
Bradford, Pennsylvania	5.00
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.80

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

	June 26 crude oil	B. of M. June demand	June 19 crude oil
Alabama	1,400	1,500	1,450
Arkansas	83,000	87,000	83,015
California	949,700	946,000	949,500
Colorado	45,710	49,000	45,640
Eastern	67,350	64,900	65,800
Florida	825	1,000	850
Illinois	171,700	178,000	171,800
Indiana	19,800	16,000	19,500
Kansas	302,600	300,000	308,050
Kentucky	23,000	26,000	23,000
Louisiana	469,300	488,000	469,250
North Louisiana	113,300	.....	113,250
South Louisiana	356,000	.....	356,000
Michigan	45,750	46,000	46,400
Mississippi	125,950	124,000	118,505
Montana	26,430	26,000	25,030
Nebraska	400	600	400
New Mexico	128,510	136,000	128,510
Oklahoma	430,850	425,000	428,450
Texas	2,457,375	2,490,000	2,457,375
Dist. 1 (Southwest)	28,700	.....	28,700
Dist. 2 (Southwest)	173,675	.....	173,675
Dist. 4 (Southwest)	256,725	.....	256,725
Dist. 3 (Gulf Coast)	498,100	.....	498,100
Dist. 5 (Eastern)	46,925	.....	46,925
Dist. 6 (Eastern)	123,100	.....	123,100
East Texas Field	312,000	.....	312,000
Dist. 7-C (West)	46,300	.....	46,300
Dist. 8 (West)	697,550	.....	697,550
Dist. 7-B (W. Central)	48,425	.....	48,425
Dist. 9 (N. Central)	139,775	.....	139,775
Dist. 10 (Panhandle)	86,100	.....	86,100
Wyoming	144,800	155,000	148,160
Total United States	*5,494,450	5,560,000	5,490,685

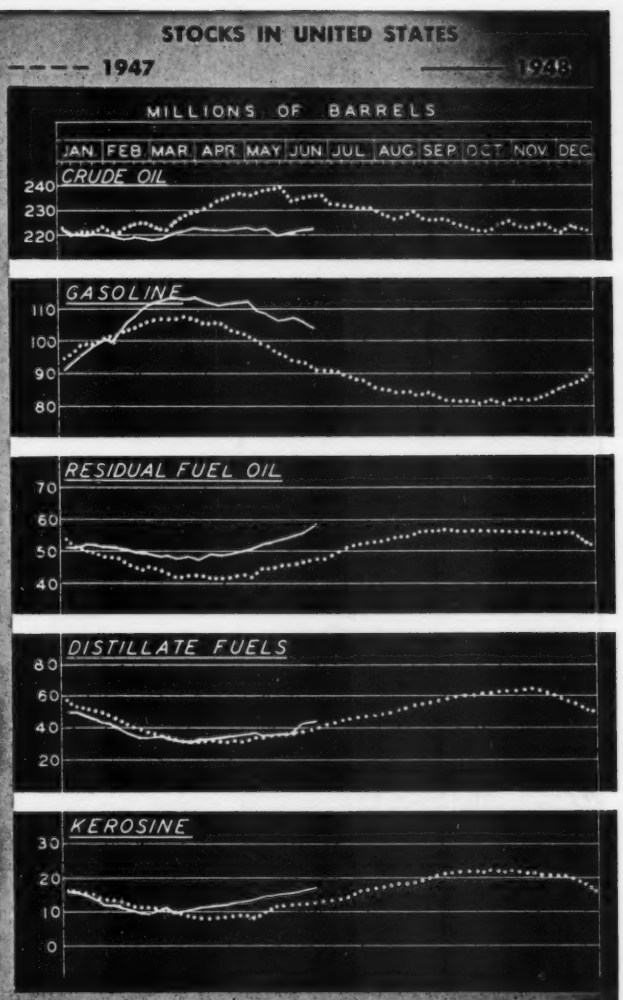
Change from prev. wk., up 3,765

Total production January 1-June 26 ..... †971,236,075 bbl.

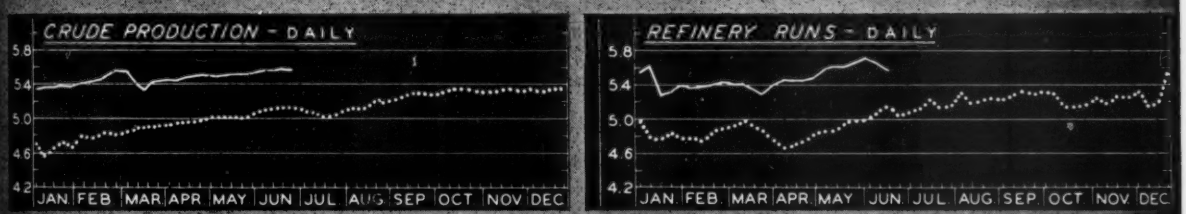
Same period last year (crude plus cond.). 869,498,340 bbl.

*Not incl. 78,950 bbl. condensate. †Incl. 13,253,320 bbl. condensate.

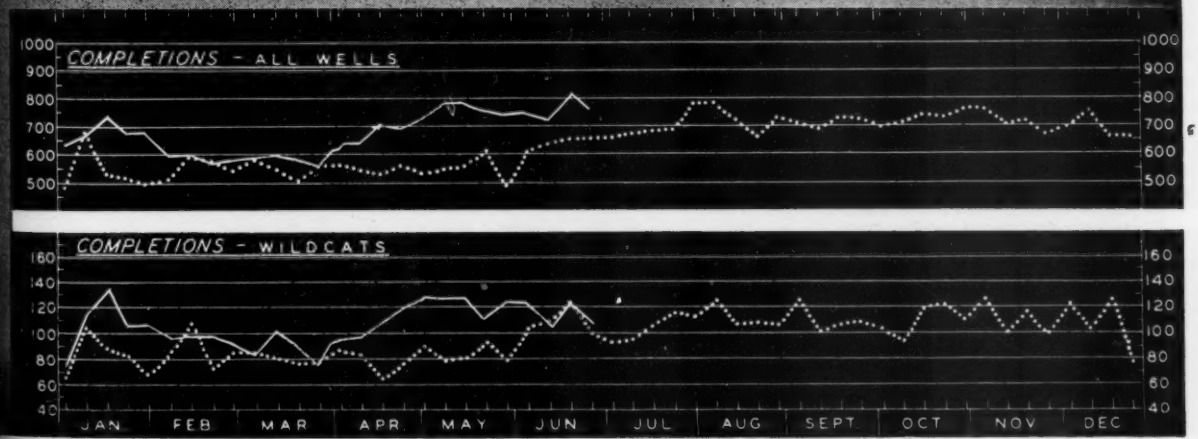
STOCKS IN UNITED STATES



DAILY OPERATIONS



WEEKLY COMPLETIONS



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MARKETS

ANOTHER flareup of rumors of an imminent crude-oil price increase, a slump in price of heavy fuel oil, and reports of some slight easing of motor-fuel demand were features of products market activity in the Gulf Coast area late last week.

Independents and majors alike were closely following developments in the crude-oil price situation. Many pointed out that one large company hard pressed by premiums could precipitate a general increase.

Products marketers were protecting themselves by tying prices in sales contracts to crude postings, providing generally that products prices go up ⅛ cent for each 5-cent rise in crude oil.

The interior market in No. 6 was reported extremely weak with prices at $2.40 and lower for spot sales. Material for water shipment was bringing around $3.25. Considerable quantities of No. 6 were reported available to buyers.

High Gasoline Prices Drop

Previously high prices of 13½ and 14 cents reported being obtained in the Houston area by one or two refiners for their regular motor fuel were down somewhat, according to reports. Other spot-market material was moving at 12½ to 12¾ cents. Tank-car supply was reported much improved, partly due apparently to freeing of some cars from West Texas crude-oil service with completion of pipe lines into the area.

In New York Harbor several suppliers reported kerosine and No. 6 oil supplies increasingly tight. Since June 15 four major companies in the eastern area have raised retail prices on some of their products. Esso Standard Oil Co., on June 24, raised tank-wagon prices of kerosine, diesel and No. 2 throughout New Jersey 0.2 cents per gallon.

Along the Eastern Seaboard price quotations generally remained unchanged.

Continued tightness in the movement of gasoline on the spot market was reported in the Mid-Continent area last week. Inquiries continued to mount and demand was strong from most quarters. Farm demand, due to the heavy rains and flooded areas in several portions of the Mid-Continent area, slackened. With harvesting over in northern Texas and southern Oklahoma plowing has begun and suppliers expect little slack farm demand for some weeks yet.

Sales Pick Up

Actual sales of light fuels, kerosine, and distillates, and to some extent No. 2 burning oil, picked up lightly last week in the Mid-Continent area, according to one supplier. Previously there was a considerable number of inquiries but relatively few movements. Many buyers were seeking kerosine and burning oils for storage.

Movements of No. 6 remained slow and demand continued to be weak. Several cars of No. 6 f.o.b. North Texas were reported sold last week at $2.50 per barrel for low-sulfur material. Some buyers reported material going even lower than $2.40 per barrel.

Effective July 1 one large Mid-Continent supplier will reduce his spot-market price quotation on 130-132 A.S.T.M. crude-scale wax from 7½ to 7 cents per pound.

No change in the general tank-car situation over the past week was reported. "Clean" cars continued to be plentiful enough, but difficulty was reported by those wanting "dirty" or "coiled" cars. Movement of asphalt continued heavy.

Representative Quotations

Representative spot-market quotations of leading suppliers as of June 28, 1948. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10½-12½	11.6-12* 10.5-11.9†	10.9-12¾
Premium gasoline, 78-80 octane	11½-13½	10.6-13.4	12.9-13½
42-44 w.w. kerosine	9½-10	10.3-11.9	10¼-10½
No. 2 straw fuel oil	9-9½	9.4-10.9	9.05-10
No. 6 residual	$2.50-2.65	$3.03-3.90	$2.56-3.00

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.6	9.9

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	12-14.5
750 vis. No. 3-4 neutral	15-17.25
2,000 No. 5-6 neutral	17-21

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	30-33
200 vis. No. 3 neutral, 0-10 pp.	29-31

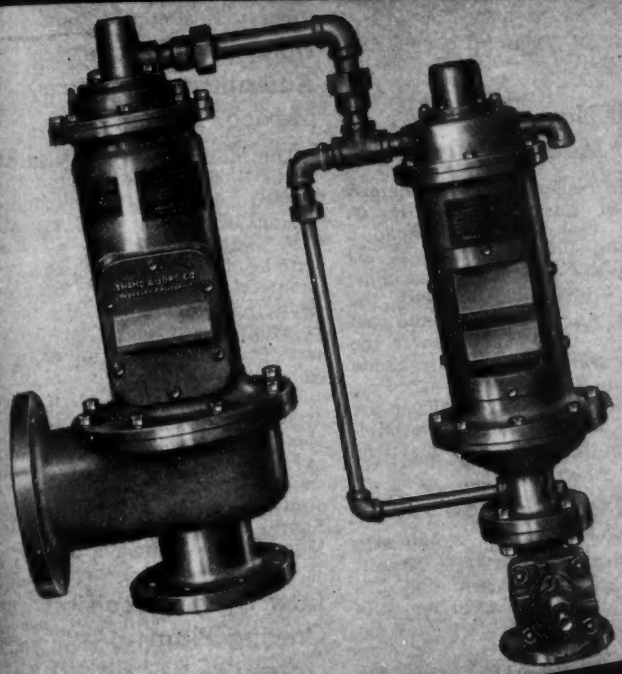
Western Pennsylvania

145-155 vis. 10 p.t. bright stock	47
180 vis. p.t. neutral	42

CRUDE-SCALE WAX
Mid-Continent

130-132 A.S.T.M. melting point	6¾-7

Engineered — NOT ADAPTED



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D. Free floating moving parts eliminate friction.

E. Working pressures from 10 to 100 lbs. per sq. in.

A SAFETY RELIEF VALVE on petroleum pressure storage tanks must perform two specific functions:

1. It must remain tightly closed at all pressures within the working range and protect the contents against evaporation.
2. It must be thoroughly dependable in operation to protect the vessel against damage from overpressure.

"Design equipment that will do just that!" Those were the instructions given to the S. & J. Engineers who conceived the safety regulator illustrated here. We wanted no adaptation of other equipment which might do half a job. We wanted a unit that was specifically engineered to do one job well—and here it is.

If you are interested in safety relief equipment that safeguards human life, conserves product and protects the storage vessel against overpressure — write for bulletin describing Model ST-2500.

SHAND & JURS CO.

BERKELEY, CALIFORNIA

NEW YORK CHICAGO HOUSTON LOS ANGELES SEATTLE

SHAND & JURS

EQUIPMENT MEN ... in the News

Cameron Appoints D. E. Wilson Chief Metallurgist

Cameron Iron Works, Houston, has announced appointment of D. E. Wilson as chief metallurgist, and G. E. Nevill as senior development engineer.

D. E. WILSON

G. E. NEVILL

Wilson is a well-known industrial technician, having served as chief metallurgist for Edwards Valve Manufacturing Co. and for Studebaker Corp., Aviation Division, Chicago. Prior to joining the Cameron organization, Wilson was works manager for Portland Forge & Foundry at Portland, Ind.

Nevill, a native of Houston, received his engineering degree from Rice in 1928, and has held engineering positions with a number of prominent oil-tool manufacturers, including Beaumont Iron Works and National Supply Co. He resigned his position on the engineering staff of Brown Shipbuilding Co. to accept his new position with Cameron. From 1942 until 1946, he was a lieutenant colonel in the Army Corps of Engineers and was stationed in the Southwest Pacific zone.

Galpin Named European Representative

M. J. Galpin, of London, England, has been appointed European representative for Clark Bros. Co., Inc., of Olean, N. Y., and International Derrick & Equipment Co. of Columbus and Dallas. Galpin spent several weeks in the United States recently, preparatory to assuming his duties abroad. Before joining the above two organizations, Galpin was with Anglo-Iranian Oil Co. for 9 years and 6 years with the Romanian oil industry. In the late war, Galpin served with the British Army from 1940 to 1946 as a lieutenant colonel. He is a graduate of Trinity College, Oxford University.

Paschall Named Division Manager

Hearn J. Paschall has been named manager of Mississippi for H. C. Smith Oil Tool Co. The company's headquarters will be located at 709 Orleans Street, Natchez, Miss. Paschall has been associated with the H. C. Smith Oil Tool Co. for the past 10 years and until recently was the company's branch manager in Santa Maria, Calif. A few months ago, Paschall made an extensive tour of the various oil fields throughout the Middle East in the interest of his firm.

Link-Belt to Build New Plant

Link-Belt Co., Chicago, announces that it has given Vivrett & Vivrett the contract for the construction of a modern new plant on a 10-acre plot of ground in the 5100 block of Wayside Drive in Houston.

Included in the project will be a one-story, all-steel factory building with three bays, and a two-story office section of masonry construction in front. The plant proper will include a modern machine shop, structural steel shop and large warehousing facilities.

This new plant, comprising approximately 45,000 sq. ft. of floor space, is being built to better serve the expanding industries of the Southwest.

Honeywell-Brown Announces Monterrey, Mexico, Branch

The Mexican subsidiary of Minneapolis-Honeywell Regulator Co. has opened a branch office at Monterrey.

Honeywell-Brown S.A., Mexico, D.F., was incorporated a year ago with headquarters in Mexico City. The Monterrey office is the first branch to be opened by the subsidiary. Increasing industrial activity in northern Mexico, and the attendant need for automatic controls of the type made by Honeywell-Brown were determining factors in establishment of the new branch.

Francisco B. Rocha has been placed in charge of the Monterrey branch. Address of the new office is Pino Suarez 486 Sur on the main Laredo-Mexico City highway.

Inco Opens Precision Casting Plant

Formal opening of the new precision casting plant of International Nickel Co. at its Bayonne, N. J., establishment was celebrated recently by an open house, inspection trip, and luncheon at which nearly 50 representatives were present. The new unit utilizes the "lost wax" method of preparing castings, and is prepared to produce the widest variety of industrial and commercial precision castings of all types and sizes.

On hand for Lane-Wells Co.'s 100,000th gun perforating job recently completed in California were: George Flanders, export sales engineer; Russell Norelius, district operation superintendent; Morton T. Hicks, manager of field operations; James D. Hughes, general sales manager; James McPhee, California division manager; Russell W. Keener, president of Petro-Tech Service Co.; Val Forsyth, assistant chief engineer; Ray Hancock, California assistant division manager; and Norman Dorn, vice president and chief engineer

Coleman of Petreco Returns to Army

Thomas V. Coleman, Jr., design engineer for Petroleum Rectifying Co. at Long Beach, Calif., has recently been called back to active duty in the Army. Coleman holds the rank of captain, and will return for service with the Signal Corps headquarters at Fort Monmouth, New Jersey.

Coleman joined the Petreco organization in April 1946, after leaving the Army. During World War II he saw action with the antiaircraft artillery in North Africa, Italy, and Southern France.

Dulin Named to Board At Lockheed

E. S. Dulin, president of Byron Jackson Co., was elected a member of the board of directors of Lockheed Aircraft Corp. at the annual meeting of the stockholders held recently at Burbank, Calif.

As president, Dulin heads up the three main divisions of the company —the pump division, the oil-tool division, and Patterson-Ballagh Co. Part of the company's service to oil-well operators is supplied by International Cementers, Inc., a subsidiary of Byron Jackson Co. Products of the company include pumps, oil tools, and oil-well rubber specialties.

Honeywell Promotes Five To New Sales Positions

A number of personnel changes including new regional, branch, and division managerships have been announced by Minneapolis - Honeywell Regulator Co.

Kent L. Wilson has been promoted to manager of the southwest region with headquarters in Dallas. The southwest region covers all of Texas and surrounding areas and includes branch offices in Dallas, Houston, New Orleans, and Wichita. Wilson follows Karl W. Schick who has resigned from the company to take over the agency of Bryant Heater Co. in Dallas.

Succeeding Wilson in Detroit is T. S. Carley who has been sales manager of the stoker and wholesale divisions at the home office.

Walter J. Baak, who has been Moduflow sales manager of the midwestern region, with headquarters in Chicago, has been promoted to sales manager of the wholesale division.

G. M. Kingsland, who has been heading sales activities of the company's control devices and specialties departments, is taking over new duties in the heating-controls division. His immediate responsibility will be to head up sales activities of the stoker-controls division.

William S. Robards has been appointed Milwaukee branch manager. He succeeds L. C. Johnson who died after a short illness in May of this year.

Kobe Makes East Texas Change

M. E. Hamilton, of Kobe, Inc., who has been in the East Texas district for the past 2½ years, has been assigned to Louisiana and Mississippi, operating out of the company's new office at Natchez, Miss. He first joined Kobe, Inc., as a field engineer, in 1941, after receiving a B.S. degree from University of Oklahoma. During the war he served as an officer in the U. S. Navy, specializing in radar. He rejoined Kobe in November 1945.

Tri-Clover Appoints Sales Engineer

Tri-Clover Machine Co., Kenosha, Wis., manufacturers of sanitary and industrial stainless steel fittings, valves, pumps, and specialties, announce the appointment of William R. Worboys as sales engineer for the West Coast. Worboys, who was formerly sales manager of Trent Tube Manufacturing Co., East Troy, Wis., will cover the states of Washington, Oregon, Idaho, California, Utah, Arizona, Nevada, and Montana.

Worboys will reside at 106 Seal Rock Drive, San Francisco.

Rancher receives new car from Tulsa firm.— Harold P. McCollum, right, retired railroad man, now operating a ranch near Locust Grove, Okla., is shown receiving a new Pontiac convertible automobile from Brooks Gutelius, Jr., of United Supply & Manufacturing Co., Tulsa. McCollum was awarded the automobile during the International Petroleum Exposition on May 22, but did not receive the car until May 31

New Directors Named by Dowell

Announcement has just been made that the board of directors of Dowell Incorporated has been enlarged to include two new members, John G. Staudt and W. E. Reardon. The Dowell board has just completed a 2-day meeting in Tulsa.

J. G. STAUDT

W. E. REARDON

Staudt joined the Dowell organization in 1932 at the time the company was formed by Dow Chemical Co. He has successively been district manager in West Texas, research engineer, assistant manager, and since 1945, executive vice president and general manager. Staudt also holds the office of treasurer and director of International Cementers, Inc., operating in California and Wyoming.

W. E. Reardon began his service with Dowell at Seminole, Okla., in 1933. He was district manager at Seminole until 1937. Since that time he has been assistant general manager of the company, with headquarters in Tulsa.

Other directors of the company are Dr. Willard H. Dow; A. P. Bentel, who is president; C. A. Campbell; N. R. Crawford; L. I. Doan; J. J. Grebe; C. Penhaligen; and W. R. Veazey.

Schaefer Retires From Wheeling Steel

Henry E. Schaefer, for many years manager of oil-country sales division of Wheeling Steel Corp., Wheeling, has retired after 46 years with the corporation. He began work as a clerk January 1, 1902, at the LaBelle Iron Works in Steubenville, Ohio, now the Steubenville Works of Wheeling Steel. He resides at 709 Sixth Avenue, Steubenville.

Twin Disc Tulsa Office Moved

The Tulsa branch sales engineering office of Twin Disc Clutch Co. has been moved to 2910 East Fifteenth Street in Tulsa from its former location at 310 East Fourth Street.

The Tulsa branch office is in charge of Wade A. Eskridge, assistant district manager, and is headquarters for Twin Disc sales and service in Oklahoma, Kansas, Missouri, and Colorado.

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: Three Ideco Winches, practically new. Suitable for 8000' well servicing. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE: Used 6⅝" OD through 14" OD Black Steel Pipe, suitable for low pressure service, road casing, etc. Utility & Industrial Supply Company, Jackson, Michigan.

FOR SALE: One 7¾x16 Gardner Denver FXQ Pump with steel skids and V-belt pump sheave. Pump completely rebuilt, new fluid cylinders and all worn parts replaced. Work done under supervision of factory representative. S. E. Frogge, Box 4455, Oklahoma City, Okla.

FOR SALE
DIESELS and PUMPS

Six new 1947 unused 475 BHP 5 cylinder Baldwin Model VG Diesel Engines, four connected to Ingersol-Rand Multi-stage Centrifugal Pumps with Farrel-Birmingham Step-up Gears and two connected to Worthington Horizontal Triplex Double Acting Pumps, all units complete with Falk Couplings, Lummus Coolers, other accessories. Location Ohio, immediate delivery. Direct inquiries to

THE BUCKEYE PIPE LINE COMPANY
Joseph Steele, Purchasing Agent,
Room 2200, 30 Broad Street,
New York 4, N. Y.

NEW 4" TUBING

200,000 ft. 4" O.D., approx. 4#, Electric and Spiral Weld Tubing, with 4½" O.D. x .237 wall Grooved Adaptor Nipples each end, 20 ft. pipe line sections, complete with couplings, tested 900#. Available immediate delivery Houston, Texas.

El Paso Pipe & Supply Co.

Ph. 2-2615 **El Paso, Texas**

EQUIPMENT FOR SALE

1 #45 Fort Worth Spudder, complete with tools to drill 4500 foot well. Condition of rig and tools A-1. For complete inventory of this equipment, write Joseph J. Snyder, 503 Oak Street, Carmi, Illinois.

BUCYRUS-ERIE 36-L Cable Tool Rig, complete with 5", 7" and some larger tools, Doghouse, Light Plant, Butane Tank, all hand tools, Pick-up Truck. Rig now working continuously on completion work, less than one year old, perfect shape. Sell complete outfit only. Write G. H. Howse, Box 113, Abilene, Texas.

FOR SALE: New Welded Steel Tanks, New Bolted Steel Tanks—100 bbl., 250 bbl., 500 bbl., 1000 bbl., 2—10,000 bbl. Used Bolted Tanks—65 bbl., 100 bbl., 250 bbl. up to 5,000 bbl. Gasoline tanks, 3-10' x 50' 4-10' x 35', 6-7' x 30'. Also Tool Houses, new or used. Write: Independent Tank Company, Seminole, Oklahoma. Phone 977.

WE BUY and SELL

Steel Pipe and Tubing
Pipe Fittings—Well Casing
Culverts and Valves

SONKEN-GALAMBA CORP.

2nd & Riverview, Kansas City 16, Kans.

3 Phase, 60 cycle, 220/440 Volt Motors
HIGH TORQUE SPLASH PROOF

Quan.	HP	Make and type	Frame	R.p.m.
3	5	L.A., FA	284	1200
9	5	C.W., SC	284	1800
13	7½	L.A., FA	324	1200
9	7½	C.W., SC	284	1800
1	25	E.D., DHX	404	1200
EXPLOSION PROOF, Class 1, Group D				
2	1	L.A., EIX	204	1200
11	1		203	1800
2	1½	L.A., EIX	224	1200
6	1½		204	1800
4	2	L.A., EX	225	1200
6	2	L.A., EX	224	1800
11	3	L.A., EX	225	1800
2	3	L.A., EX	224	3600
3	5	G.E., K	254	1800
3	5		225	3600
1	7½	West., CS	326	900
5	7½		284	1800
1	10	G.E., K	364	875
2	10	L.A., EX	324	1800
2	15	G.E., K	326	1800
4	15	L.A., EX	324	3600
1	20	A.C., ARZZ	326	3600
1	25	L.A., EX	364S	3600
1	40	L.A., EX	444	1800
1	40	L.A., EX	404S	3600
1	50	L.A., EX	445S	1800
3	100	West., CS	753S	*1800
EXPLOSION PROOF, Single Phase, 115/230 Volts				
8	2	L.A., ECU	225	1800
2	3	L.A., ECU	254	1800

*Used.

ROY A. BERENTZ CO., INC.
Electrical and Mechanical Equipment
P. O. Box 564—Phone C4-6558
Houston 1, Texas

EQUIPMENT FOR SALE

DRILLING equipment, reconditioned ready for delivery, Failing, Franks, Ell Tulsa, Longyear, American, Sullivan, Fort Worth, Wichita, Keystone, National, Standards. Also steel derricks, cable tools, cable and good used casing, most sizes. Pressey & Son, Pueblo, Colo.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

PUMPS

Centrifugal and Reciprocating Chrysler Industrial Engines. Write for list and prices.

H. A. McCARTHY
310 Thompson Bldg., Tulsa, Oklahoma
Phone 5-3296

STEEL STORAGE TANKS

2—74,000 Bbl. Cap. Riveter
8—10,000 Gal. Cap. Horiz. Welded
100,000 Gal. Cap. on 110 Ft. Tower.

DARIEN CORP.
60 E. 42nd St., N. Y. 17, N. Y.

WILL SACRIFICE!

Must Vacate Property

RECIPROCATING STEAM PUMPS

4—Simplex 24 x 6 x 16 Hot Oil
1—Duplex 10 x 3½ x 10 Hot Oil
1—Simplex 8 x 4 x 12
3—Duplex 7½ x 6 x 10 Water cooled
2—Duplex 7 x 4½ x 10
7—Duplex 6 x 4 x 6
4—Duplex 4½ x 2¾ x 4

STEEL STORAGE TANKS

1—10,000 gal. Horizontal 12' x 12'
3—10,000 gal. Horizontal 7' 6" x 32' 10"

BUBBLE AND OTHER TOWERS

1—3' x 50' x⅜", 17 trays, 24 C/1 Bubble Caps, welded seams
1—2' x 44' x ⅜", 31 trays, dished heads, welded seams
1—3' x 40' 6" x ¼", 15 trays, dished heads, welded seams
1—3' x 38' x ¼", 15 trays, dished heads, welded seams
1—6' x 50' 6" x ½", 18 trays, 64 C/1 Bubble Caps, welded seams
1—7' x 60' x ½", 24 trays, 86 C/1 Bubble Caps, welded seams
1—Clay Tower 10' x 35' 6" x ½", dished heads, welded seams
2—Tar Stripper 6' x 28' 6" x ⅜", 1 tray, dished heads, welded seams
1—Stripper 2' 6" x 16' x 5/16", dished heads, welded seams
2—Side Stripper 3' x 12' 4" x 5/16", 4 trays, dished heads, welded seams
1—Vessel, 4' 11" x 13' 10" x 1", dished heads
2—Vaporizer 6' x 30' x ½", welded seams, dished heads
1—Vaporizer 6' x 30' x ⅜", welded seams, dished heads
1—Vaporizer 5' x 24' x ⅜", welded seams, dished heads

BRICK UNIT FURNACES

1—19' 2" x 24' 8" x 17' 6" x 24" Wall Thickness. 156 Plain carbon steel tubes, 4" OD x 22' x 7/16", 10 Zinc Natural Gas Burners. Complete with stack.
1—17' x 22' 5" x 24" Wall Thickness. 120 Plain carbon steel tubes 3" OD x 20' x ½", 6 Zinc Natural Gas Burners, Complete with stack.

PLUS HEAT EXCHANGERS, CONDENSER BOXES, COIL FURNACES, INSTRUMENTS.

Rush inquiries and request for complete listings to

BROWN-STRAUSS CORPORATION
P. O. Box 11
Galena Park, Texas
All listings subject to prior sale.

EQUIPMENT FOR SALE

FOR SALE: 8000′ 6″ 20 lb. casing No. 1, Price $3.00, and 650′ 8″ casing No. 1, price $3.50. M. J. Regan, Coffeyville, Kansas.

45 ST Star Spudder, without tools and line, with 120 hp. Hercules engine. Machine in excellent shape. Travco Equipment Co., 110 Midco Bldg., Tulsa. 5-2251.

DIESEL electric plant; Winton, heavy duty, complete with all accessories, 325 HP., 360 R.P.M., direct connected to Westinghouse generator, 282 K.V.A., 240 Volts, 3 phase, 60 cycle, with direct connected exciter, panel board with automatic voltage regulator, pumps, heat exchanger, muffler, etc., A-1 condition. For further information write Sam Warren & Son Stone Company, 822 S. 24th St., Louisville, 10, Ky.

STEEL CONSUMERS!

Do you need Plates or other Steel Products for tanks or for welded pipe?

Delegate your steel purchases to us and let us supply you with your needs.

Only end-users will be given consideration.

OVINGSTEEL, INC.

30 Church Street New York 7, N. Y.

IMMEDIATE DELIVERY

500,000 Feet of 4″ O.D. x ⅛″ Wall

NEW ELECTRIC WELD STEEL (INVASION) TUBING AND COUPLINGS

3.75 lbs. per foot all in 20-foot lengths.

LOUISIANA IRON & SUPPLY CO.

SHREVEPORT, LA.

L.D. 1 or 35223

EQUIPMENT FOR SALE

FOR SALE: Wilson Super Model Winch powered by 6 MZR Waukesha engine. Terms. Melton Supply Company, Seminole, Oklahoma.

SLUSH pump. Wheatley 6 x 6 with 4½″ liners, Mission equipped. V-belted to 25 H.P. gas-gasoline Waukesha engine. Box 127, Little Rock, Arkansas.

DIAMOND core drill. New 22-HD Sullivan core drill, fully equipped, inventory of $11,000, drilled 1500′. Will sell or trade for Bucyrus-Erie 24-L or 22-W. Box C-426, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Rotary drilling rig complete, Cardwell Draw Works, International and Waukesha motors, Gardner-Denver pump, 4½″ drill pipe, Oil well bath rotary table, 1600 gallon butane tank, 96 foot mast and all equipment complete necessary for drilling operation. Now operating in western Kentucky. Priced to sell. Contact Ashby Bros. Drilling Co., 1906 St. Clair Avenue, East St. Louis, Illinois.

FOR SALE: Wilson Master Model Winch powered by 6 MZR Waukesha engine. Unit mounted on one and one-half ton Chevrolet truck equipped with fifty foot single pole telescoping mast. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE: Rod and Tubing Pulling Unit, $9500.00. Cardwell winch Model H with Waukesha Motor 6MZ, mounted on army style 2½ ton, 1943 model GMC 6x6. All tools for 2 and 2½ inch tubing and ⅝″, ¾″ and ⅞″ rods, sand line and bailer and set of fishing tools included in price. Write Box 1402, Pampa, Texas, or call Pampa 1095.

STEEL STORAGE TANKS

2—18,500 bbl. Welded
2—17,500 bbl. Riveted
1— 3,800 bbl. Riveted

Above tanks all with steel cone roofs, now standing location Ingleside, Texas. Will quote dismantled and erected your grade in Mid-Continent area. Complete specs. available upon request.

TANCRED STEEL CONSTRUCTION CO.

Ph. Riverside 3546 Dallas, Texas

EQUIPMENT FOR SALE

FOR SALE: 60 HP Webber Gas Engine—convertible to oil—good condition. Fren Oil Company, P.O. Box 158, Loco Hills, New Mexico.

FOR SALE in Southern Illinois: 560′—8¼ 28 lb. casing; 1500′—6¼ 17 lb. casing; 2500′ 2 inch line pipe; 1000′ 2 inch straight tubing; one 25 H.P. Superior Gas Engine. Box C-443, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 6 Angle Iron Cable Tool Derricks, complete with sheet metal and lumber. Excellent Condition. Utility & Industrial Supply Company, Jackson, Michigan.

FOR SALE: New 24″ and 26″ OD Black Steel Pipe, suitable for Low Pressure Service. Utility & Industrial Supply Company, Jackson, Michigan.

THREE Kilowatt 110 volt single or three-phase power unit completely cased with control panel. Hercules engine, automatic starting. $350. Westinghouse Flex-Arc welder 1000 amps, A-1 condition. $500. Arco-Wand vacuum cleaners, single or three-phase, one HP. $100. Reconditioned Martin-Decker slim hole weight indicator. Half new price. $150. D & M Sales Company, Box 2497, Tulsa 6, Oklahoma.

FOR SALE

3—80′ Angle iron steel drilling derricks with foundation timbers.

1—220 H.P. Waukesha drilling unit.

1—145 H.P. Waukesha drilling unit.

1—170 H.P. Young drilling motor.

1—2 Cyl. Cooper-Bessemer 10½ x 11 Gas Engine.

1—13 x 15 Franklin OF Oil Engine.

Above all in good used condition.

Priced Reasonable

Write or phone

M. N. BUTLER

128½ E. Liberty St.

Wooster, Ohio

DRILLING EQUIPMENT FOR SALE

1—Emsco 27½″ roller bearing rotary table, in good running shape	$600.00
1—Oil Well 6″ Swivel, which was in running shape when we shut down	$250.00
2—Union Tool 6″ swivels. Both needing some shop work, each	$200.00
1—Shop made rathole digger, for derrick	$150.00
1—Shop made connection rack, about 6′ x 3′ x 30′	$175.00
1—8″ Union Tool spring hook	$300.00
1—8″ Johnson draw works, well unitized, with automatic cathead	$600.00
1—G6 Swivel, just out of shop	$400.00
1—210-bbl. Welded tank, fair shape only, but will hold oil	$225.00
1—225 H.P. 8-cylinder LeRoi engine, old model	$850.00
1—F27 Clutch (OCS cable tool, which has been rigged up for rotary)	$250.00
1—90 H.P. 180# W.P. boiler, with new flues, which have been fired about 8 days	$700.00
1—100 H.P., 200# W.P., Kewanee boiler with full length flues. Made four wells since flues put in. Needs small amount repairs	$750.00
1—100 H.P., 250# W.P. Lucey boiler with full length flues. Made four wells since flues put in. Needs small amount repairs	$1,000.00
1—7″ x about 50′ sectional bailer (3 sections)	$150.00
1—Unitized boiler feed pump assembly, with light plant and tool box on same skids; and 2 B.F. pumps about 10″ x 4½″ x 10″, in running shape	$375.00
2—Sets B. J. Wilson tongs complete, 4″ & 6″ heads. Each	$175.00

1—Hughes core barrel about 4½″ O.D. for 5⅝″ to 6½″ hole. Has 3½″ flush joint sub. No. TWG8839. Good shape. Half price.

1—Core barrel about 6″ O.D. for 7⅜″ to 8¾″ hole. Good shape and half price.

1—American double overshot for 7⅜″ to 8¾″ hole. A-1 condition. 60% of new price.

The above located near Borger, Texas

Will buy any size drill pipe. Please quote.

THE CLAY BROS. DRILLING COMPANY, INC.

1804 Fair Building, Fort Worth, Texas

Brand New!

WILSON-SNYDER HOT OIL PUMP

Price $2500.00 F.O.B. Kansas City

- **Capacity: 55 Gallons Per Minute.**
- **Speed: 70 R.P.M.**
- **Head Pressure: 1600 lbs.**
- **Piston Size: 2¾″.**
- **Stroke: 8″.**
- **Stub Shaft: 2⅞″ Diameter, arranged for gear drive.**
- **Serial Number: 12862.**

Write, Phone or Wire:

BROWN-STRAUSS Corporation

P.O. Box 78, Kansas City, Missouri

Phone: Ha. 1000

EQUIPMENT FOR SALE

ONE 5½ Keystone Rig on Steel, complete with tools from 10″ down. A-1 condition. Five Thousand Dollars. Rig in service at present at Chanute, Kansas. Neosho Drilling Co., Box 265, Chanute.

1 CARDWELL Double Drum Cable Tool Drilling Unit, without power unit, capable of spooling 6,500 feet 9/16″ sand line and 6,500 feet ⅞″ drilling line. Located in Fitts Oil Field. Price $3,000 cash, F.O.B. lease. Telephone 33, Fittstown Exchange, P. O. Box 2, Harden City, Oklahoma.

CATERPILLAR D-13000 — completely rebuilt. Caterpillar D-4 with Hydraulic Bulldozer and Hyster Towing Winch. Martin Tractor Co., Chanute, Kansas.

FOR SALE: Franks 4000 Servicing Unit or Spudder complete with tools. A-1 shape. Or trade for Bucyrus 24. Box 86, Casey, Illinois.

WEIGHTED DRILLING MUD
Have hi-grade deposit of barite suitable for manufacture of weighted drilling mud. Ideal for party looking for private source of supply. Will sell, lease, or contract delivery of crude ore or ground natural product. R. B. McElwaine, P.O. Box 127, Little Rock, Ark.

FOR SALE: 1-AE6 Emsco Rotary Swivel (New) 130 ton capacity for medium drilling up to 8,000 feet, 4 in. drill pipe at 100 RPM a minute. Priced right. 2—100 H.P. 250 lb. Working Pressure Oil Well Type #1010 Locomotive Steam Boilers. Boilers practically new, used a short time, will stand Insurance and State requirements. Priced right. W. P. Reilly, P.O. Box 2084, Phone 2272-J or 1434, Pampa, Texas.

STEAM PUMPS FOR SALE

National Transit Duplex Steam Pumps
3—10 x 3 x 10
20—10 x 3½ x 10
6—10 x 4½ x 10

Gardner Duplex Steam Pumps
10—10 x 3½ x 10
1—10 x 4 x 10
6—10 x 4½ x 10

Worthington Duplex Steam Pumps
2—10 x 3 x 10
40—10 x 3½ x 10
9—10 x 4½ x 10

1—12 x 12 Oilwell Steam engine, serial #80009 with F&M pump jack, serial 159012.

OKLAHOMA PIPE & SUPPLY
Box 4671 Tel. 62-1644
Oklahoma City, Okla.

FOR SALE
STAINLESS STEEL
NAPTHENIC ACID PLANT

One—36″ I.D. x 32′ x ¼″ Shell Stainless steel Fractionator with 7′-7″ skirt——with 10 trays.

Four—5″ x 3″ x 6″ Union Simplex Steam Pumps with solid stainless fluid ends.

One—Heater and Reboiler with 1″ I.D. tubes and bolted return headers—stainless.

One—Condenser with ¾ I.D. tubes and bolted return headers—stainless.

Charge and product piping — stainless steel.

Analysis of stainless steel:
18% Chrome
8% Nickel
3% Molybdenum
½ to 1% Columbium

PLANT IN EXCELLENT CONDITION.
WE INVITE YOUR INSPECTION.

PROCESS
CONSTRUCTION CO., Inc.

20700 South Figueroa Street
Torrance, California
Los Angeles Phone:
PLeasant 2-6355
PLeasant 1-6660

EQUIPMENT WANTED

WANTED: Used Cross Reaction Chamber. Approximately 5′ OD x 44′ long. State price, condition, location, enclose sketch. Box C-422, The Oil and Gas Journal, Tulsa, Oklahoma.

USED Landis Head 4″ to 8″ good condition. Amarillo Junk Co., P. O. Box 727, Amarillo, Texas.

WANTED TO BUY: 1—13″ x 14″ Clark Bros. Compressor Cylinder for RA-32, complete. C. J. Smith, 427 Mayo Building, Phone 5-3416, Tulsa, Oklahoma.

WANTED

Pipe and Tubing, New or Used

WALLACK BROS.
7400 S. Damen Ave. Gro. 7474
Chicago 36, Ill.

HELP WANTED

PETROLEUM ENGINEER with wide experience in mid-continent area. Excellent field for capable man; liberal compensation. Replies confidential. Box C-458, The Oil and Gas Journal, Tulsa, Okla.

DRILLERS WANTED: Here is opportunity to average better than $100 a week on a commission (footage) basis if you are competent and sober and know how to make hole with heavy modern rigs and tools; within radius of 30 miles of Milwaukee. Gray Well Drilling Co., Delafield, Wisconsin. Phone 1051.

ENGINEER COST RESEARCH Engineer for research in petroleum refinery equipment cost. Experience with refinery or comparable process industry equipment essential. Location Chicago. Salary commensurate with training and experience. Standard Oil Company (Indiana), Room 200, Box 5910-A, Chicago 80, Illinois.

WANTED: Draftsmen, designers, checkers, familiar with petroleum refinery piping, structural, reinforced concrete, pressure vessels. 48-hour week, liberal pay. Write, giving full particulars on experience, age, availability, past salaries. All replies confidential. Refinery Engineering Company, Box 1977, Tulsa, Oklahoma.

CHEMIST WANTED
Chief chemist for a medium size Mid-Continent asphalt refinery. Must be graduate of recognized university or college and have had experience in asphalt work, be capable of conducting research and directing staff in routine operation tests. Excellent opportunity for qualified man. Salary will be discussed in personal interview. Box C-434, The Oil and Gas Journal, Tulsa, Oklahoma.

MECHANICAL ENGINEER—For petroleum refinery of medium size. Varied duties. Recent graduate preferred. Box C-440, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Refinery Superintendent, Midwest Refinery. 4000 Barrels per Day Skimming, 1500 Barrels per day Cracking. In reply state experience, education and salary desired. Box C-392, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

WANTED—Land Department scouts, by large, independent oil company, for work in Mid-Continent and Rocky Mountain areas. College graduates, age 24-30 preferred. Good opportunity for advancement. Give all details in first letter as to age, education, and experience. Our employees have been informed of this ad. C-461, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER
Position with excellent opportunity for a petroleum engineer with background or educational foundation necessary to assist with detailed geological and reservoir studies in southwest Texas. Minimum of one or two years experience desirable. In replying give full details of education, experience, and salary expected. Replies confidential. Box C-441, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM EXECUTIVE: Large expanding independent oil company now has two new positions. One is for general superintendent of production, the other is for general pipeline superintendent. These are unusual positions. Individuals who qualify must be experienced executives with top experience in their respective fields. In answering please state age, experience, and salary requirement. Our employes know of this ad. Replies held confidential. Address: Box C-455, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED
ELECTRICAL SALESMAN FOR OIL INDUSTRY

We have openings in Dallas and Tulsa for experienced salesman. Prefer graduate engineer, veteran, married, 25-35 age. Please submit complete information as to education and experience, also recent photograph. We pay salary, expenses, and bonus. Our employes know of these openings.

Box C-442, The Oil and Gas Journal, Tulsa, Oklahoma.

Large independent oil company has a number of desirable openings in its Refining Division for qualified individuals of five to fifteen years' experience in refining field as follows:

1. Supervision—thermal and catalytic cracking.

2. Supervision—modern lube oil refinery, propane, M.E.K., phenol.

3. Supervision—general refinery maintenance.

4. Equipment Inspectors.

Applicant please supply resume of experience, photo and expected salary in initial reply.

Box C-435, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED

Chemical or Mechanical Engineer for position as

SENIOR PROJECT ENGINEER

Minimum of 10 years Oil Refinery Experience

Familiar with Catalytic Cracking Process and Design

Salary Commensurate with Background and Responsibilities

Letter Requesting Interview should state Education, Experience and Minimum Salary Required

Box C-425, The Oil and Gas Journal, Tulsa, Oklahoma

HELP WANTED

WANTED: Independent producer with over 20 years successful operations having very substantial production wants Field Production Superintendent capable of all field operations including drilling operations and productions in a section of Illinois Basin area. An excellent opportunity for the right man to get permanently located. Box C-447, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Man with background in geology, capable of directing and coordinating land and geological departments of independent oil company located in Oklahoma. In answering give training, experience, salary expected, and personal details. Box C-384, The Oil and Gas Journal, Tulsa, Oklahoma.

STRUCTURAL—Designers — Draftsmen — Openings for men experienced in design of Gas Processing Plants. 48 Hour Work—Good Pay—Air Conditioned Office. Fish Engineering Corp., 754 M & M Bldg., Houston, Texas. Phone C 4-5401.

WANTED: Experienced Surveyors for domestic gravity crews. $250.00 minimum salary for qualifying man. Box C-448, The Oil and Gas Journal.

WANTED: Oil and gas producing company operating in Gulf Coast needs experienced man to rework and review seismic data. Geological background preferred. Permanent location in main office. Salary open. All inquiries confidential. Address: Box C-420, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Industry Employment Service, 319 Castle Bldg., Tulsa, Okla., Mr. Robinson, Mgr., phone 4-5974. No fees to pay. Foreign service. Our client, a producing company in Persian Gulf area needs: (1) Assistant to General Manager. (2) Technical Assistant to General Manager. (3) Adm. Assistant to General Manager. (4) Division Pipeline Supt. (5) Office Assistant to pipeline supt. (6) Regulator Maintenance Engineer. (7) Meter Engineer. (8) Chief Production Clerk. (9) Assistant Reservoir Engineer. (10) Several Petroleum Engineers. (11) Several rotary drillers. (12) Several derrickmen. (13) Several combination cat-truck drivers. (14) Several American Chefs. (15) Reservoir Engineer in London. Only experienced men considered.

CHEMICAL ENGINEER to assist in treatment of salt water and corrosion control. Engineering degree required. Starting salary according to qualifications.

EAST TEXAS SALT WATER DISPOSAL COMPANY
Kilgore, Texas

WANTED

Production Superintendent for Western Kansas independent oil producer. To take charge of production and oversee drilling program (contractor's tools). Must have experience and knowledge of latest production practices, rotary and cable tool drilling. Car and modern house furnished. State salary desired. Only those with proper experience and good references need apply. Box C-444, The Oil and Gas Journal, Tulsa, Okla.

CONSTRUCTION INSPECTORS

Needed in connection with extensive construction program of gasoline plants, a large synthesis plant and pipe line projects. Applicants should be experienced in refinery, gasoline plant or pipe line construction and should be either graduate engineers, experienced inspectors, or have had considerable supervisory experience in related work. Salary commensurate with training and experience and educational qualifications in first letter. Address inquiries to Employment Office,

STANOLIND OIL AND GAS COMPANY
Box 591, Tulsa 2, Oklahoma.

SITUATIONS WANTED

SALES ENGINEER desires connection at Oklahoma City as representative for manufacturer of oil field equipment. Ten yrs. experience with major supply companies. Box C-325, The Oil and Gas Journal, Tulsa, Okla.

SEISMOLOGIST: Several years experience with major oil company in computing and interpretation. College graduate. Desires interpretive work in permanent location with major oil company. Box C-410, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST—Permian Basin and Rocky Mountain experience. Write Box C-438, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Drilling and Mud Engineer available for foreign employment. Some Spanish. Write Box C-453, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE petroleum engineer, experienced in production and related problems and some well completion, desires position in production department. Box C-454, The Oil and Gas Journal, Tulsa, Oklahoma.

DESIRE position as chief mud engineer—five years field experience in Gulf Coast and Mid-Continent well drilling and completion operations. Degree in Chemical Engineering. Box C-460, The Oil and Gas Journal, Tulsa, Oklahoma.

WISH to contact Oil or Drilling Executive who considers Quarter-Century Oilfield Accounting experience and mature judgment desirable rather than detrimental. Box C-459, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE PETROLEUM ENGINEER Executive assistant with large producing company. Experienced in technical administrative work in production. Desires position with major or established independent. Age 33. Prefers East or Middle West but will consider anywhere. Box C-445, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPING Draftsman: Will be available in thirty days. Now employed as squad leader on high pressure plant now under construction. Foreign employment acceptable. Box C-457, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION

SCHEDULED AIRLINE TRANSPORT PILOT desires change to private flying. Over 10 years experience without accident or violation. 4,330 hours multi-engine time with major airline. My record will warrant lowest insurance rates for dependable day, night or instrument executive travel.

Box C-433, The Oil and Gas Journal, Tulsa, Oklahoma

PERSONAL

WANTED to Contact — Lou Huddleson, Geologist, and Byers Edwards, Driller. Box 152, Litchfield, Illinois.

Application for Membership in the Diesel Engineers International Assn.
576 Newark Ave., Jersey City, N. J.
Name .....
Address .....
Reference .....

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908 Oil-Gas (all states), Business, Real Estate Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on Request. Burkhart Printing & Stationery Company, 11[illegible] South Cincinnati, Tulsa 3, Oklahoma.

ROYALTIES

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

WE will buy producing or non-producing oil royalties. Send particulars. Standard Security Company, 115 Broadway, New York 6

LEASE AND DRILLING BLOCKS

HAVE oil leases on structure 650 feet. Can give offsets. Will take override. Also 1600 acre block for deeper well. Box 86, Casey, Illinois.

FOR SALE: 240 acre Lease, Christian County, Illinois. Three wells pumping 20 bbls. per day. Devonian 1900 Ft. For detailed information write: Wm. Marlowe, 1104 Fayette, Springfield, Illinois.

SOUTHEASTERN NEW MEXICO
Leases, royalties and drilling blocks. Grant Keyes, 311 White Bldg., Roswell, New Mexico.

1300 ACRES, Oklahoma hot spot, excellent geology, shallow drilling, well down 400 ft., $5,000 handles. L. H. Vinnedge, Country Campus, Huntsville, Texas.

ALBERTA, CANADA—640 acres, no restrictions, excepting coal. Not far from oil and gas production. Will lease for drilling. W. R. Dobbin, State Center, Iowa.

FOR SALE: Lea County, New Mexico, Oil and Gas Royalties, in active areas; Winkler County, Texas, Oil and Gas Royalty, near production. Harry Haynes, Grantville, Kansas.

FOR SALE: New 64 acre lease, N. T. Mills Survey, Shelby County, Texas, Arkansas Fuel Block. Located in heart of activity. Price, $10 per acre. Arkansas to start well at once. C. A. Parker, Box 451, Center, Texas.

320 ACRES in Kansas, with Geology; close to production (130 producers, 6 dry holes in pool); major companies having offset acreage. Will give big interest for coring sand or will consider small overriding interest for completed well. Box C-456, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 980 acre lease—200 sand acres depth 400' Bville Sand—cores show average 5000 bbl. recoverable per acre, small flood now on. 55 wells equipped, one 5½ Keystone, one nearly new 71 Spud Star Drilling Machine with tools—sell with or without tools. Two miles east, two south of Walnut, Kansas. Phone 12F2, Walnut.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma Louisiana and Illinois.
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W.. Washington 5, D. C.

WANTED

GASOLINE PLANT WANTED FOR PURCHASE

10,000 to 25,000 gals. per day capacity. Send full particulars. All replies held confidential. Box C-421, The Oil and Gas Journal, Tulsa, Oklahoma.

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CALENDAR OF EVENTS

July

Third Annual Drilling Industry Safety Clinic, Baker Hotel, Dallas, July 6-7.

August

Appalachian Gas Measurement Short Course, eighth annual session, West Virginia University School of Mines, Morgantown, W. Va., August 30-September 1.

September

American Chemical Society, Division of Petroleum Chemistry, fall meeting, St. Louis, September 6-10.

The Instrument Society of America, third instrument conference and exhibit, Philadelphia Convention Hall, Philadelphia, September 13-17.

Pacific Coast Gas Association, annual convention, Hotel Casa del Rey, Santa Cruz, Calif., September 14-16.

American Petroleum Institute, Lubrication Committee, Hotel Traymore, Atlantic City. N. J., September 15-17.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 15-17.

Oklahoma Utilities Association, Gas Division, annual conference, Biltmore Hotel, Oklahoma City, September 17.

National Butane-Propane Association annual convention and trade exhibit, Congress Hotel, Chicago, Ill., September 20-22.

Independent Petroleum Association of America, annual meeting, Plaza Hotel, San Antonio, Tex., September 27-28.

October

American Society of Mechanical Engineers, petroleum division, Herring Hotel, Amarillo, Tex., October 3-6.

American Institute of Mining & Metallurgical Engineers, petroleum division, fall meeting, Adolphus Hotel, Dallas, October 4-6.

American Association of Petroleum Geologists, midyear meeting, technical session and 3-day field trip, William Penn Hotel, Pittsburgh, Pa., October 4-9.

California Natural Gasoline Association, twenty-fourth annual fall meeting, Ambassador Hotel, Los Angeles, Calif., October 8.

American Gas Association, annual convention, technical section, Ambassador Hotel, Atlantic City, October 4-9.

National Lubricating Grease Institute, sixteenth annual convention, Edgewater Beach Hotel, Chicago, October 11-13.

American Association of Oilwell Drilling Contractors, eighth annual meeting, Rice Hotel, Houston, October 11-13.

Texas Mid-Continent Oil and Gas Association, twenty-ninth annual meeting, Fort Worth, October 14-15.

American Institute of Mining and Metallurgical Engineers, petroleum division, Elks Club, Los Angeles, Calif., October 14-15.

Independent Natural Gas Association of America, annual meeting, Mayo Hotel, Tulsa, October 26.

November

American Society of Mechanical Engineers, fuels division, Greenbrier Hotel, White Sulphur Springs, W. Va., November 3-4.

Society of Automotive Engineers, fuels and lubricants division, Mayo Hotel, Tulsa, November 4-5.

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 8-11.

January 1949

Society of Automotive Engineers, annual meeting, Book-Cadillac Hotel, Detroit, Mich., January 10-14.

March 1949

New England Gas Association, Hotel Statler, Boston, March 24-25.

American Chemical Society, division of petroleum chemistry, spring meeting, San Francisco, March 27-April 1.

April 1949

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

NOMADS

Houston Nomads, second Monday of each month, The Houston Club, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

New York Nomads: Golf party, Sept. 21, at Baltusrol Country Club, N. J.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as Tract 49E (NW¼SE¼) sec. 21, T. 43 N., R. 92 W., 6th P.M., Wyoming, 40.23 acres, and is within the known geologic structure of the Kirby Creek field undefined. Bids must be submitted on or before 1 p.m., Eastern Daylight Saving Time, July 21, 1948. Marion Clawson, Director.

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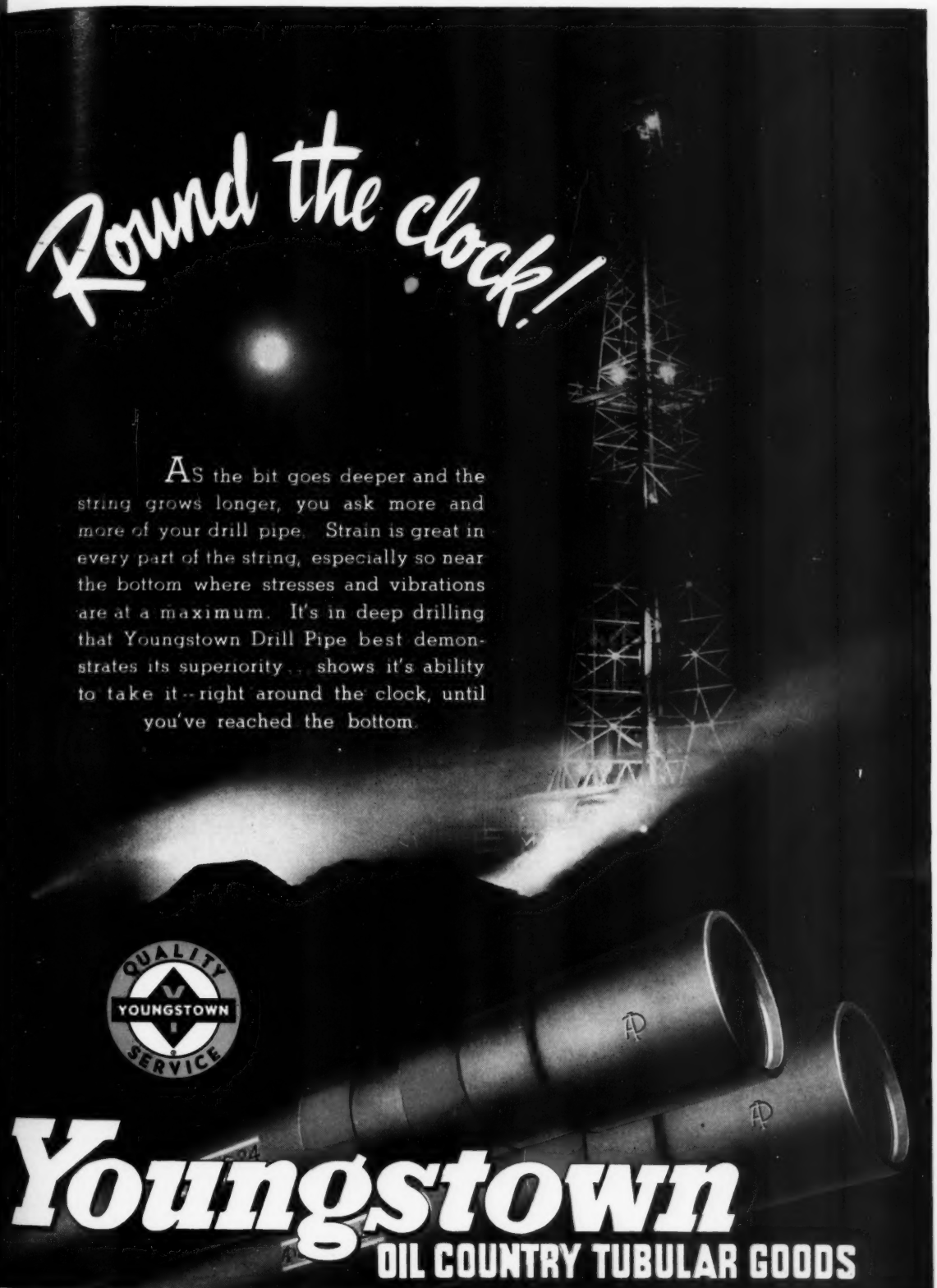
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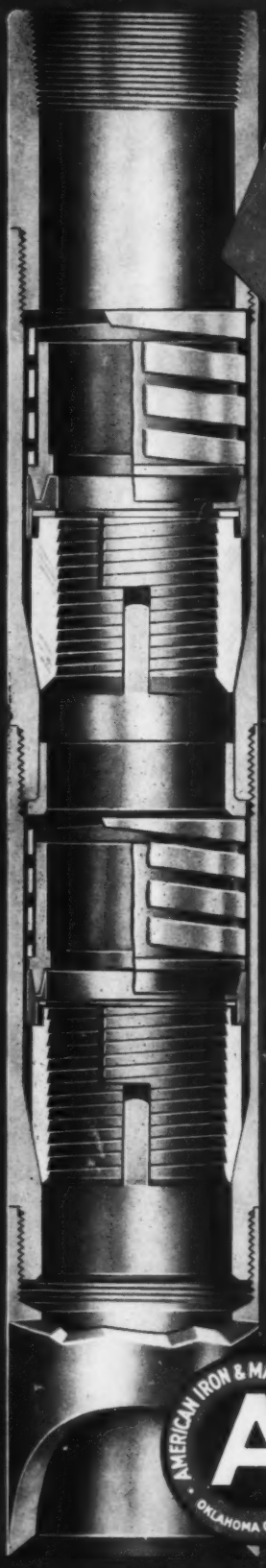

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18

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THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

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FOR CABLE TOOLS
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FOR SALE: Three Ideco Winches, practically new. Suitable for 8000' well servicing. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE: Used 6⅝" OD through 14" OD Black Steel Pipe, suitable for low pressure service, road casing, etc. Utility & Industrial Supply Company, Jackson, Michigan.

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El Paso Pipe & Supply Co.

Ph. 2-2515 — El Paso, Texas

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1 #45 Fort Worth Spudder, complete with tools to drill 4500 foot well. Condition of rig and tools A-1. For complete inventory of this equipment, write Joseph J. Snyder, 503 Oak Street, Carmi, Illinois.

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9	5	C.W., SC	284	1800
13	7½	L.A., FA	324	1200
9	7½	C.W., SC	284	1800
1	25	E.D., DHX	404	1200

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11	1		203	1800
2	1½	L.A., EIX	224	1200
6	1½		204	1800
4	2	L.A., EX	225	1200
6	2	L.A., EX	224	1800
11	3	L.A., EX	225	1800
2	3	L.A., EX	224	3600
3	5	G.E., K	254	1800
3	5		225	3600
1	7½	West., CS	326	900
5	7½		284	1800
1	10	G.E., K	364	875
2	10	L.A., EX	324	1800
2	15	G.E., K	326	1800
4	15	L.A., EX	324	3600
1	20	A.C., ARZZ	326	3600
1	25	L.A., EX	364S	3600
1	40	L.A., EX	444	1800
1	40	L.A., EX	404S	3600
1	50	L.A., EX	445S	1800
3	100	West., CS	753S	*1800

EXPLOSION PROOF, Single Phase, 115/230 Volts

8	2	L.A., ECU	225	1800
2	3	L.A., ECU	254	1800

*Used.

ROY A. BERENTZ CO., INC.
Electrical and Mechanical Equipment
P. O. Box 554—Phone C4-6558
Houston 1, Texas

EQUIPMENT FOR SALE

DRILLING equipment, reconditioned ready for delivery, Failing, Franks, Ellis Tulsa, Longyear, American, Sullivan, Fort Worth, Wichita, Keystone, National, Standards. Also steel derricks, cable tools, cable and good used casing, most sizes. Pressey & Son, Pueblo, Colo.

FOR SALE

12—220 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—220 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

EAGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

PUMPS

Centrifugal and Reciprocating Chrysler Industrial Engines. Write for list and prices.

H. A. McCARTHY
818 Thompson Bldg., Tulsa, Oklahoma
Phone 5-3296

STEEL STORAGE TANKS

2—74,000 Bbl. Cap. Riveter
8—10,000 Gal. Cap. Horiz. Welded
100,000 Gal. Cap. on 110 Ft. Tower.

DARIEN CORP.
60 E. 42nd St., N. Y. 17, N. Y.

WILL SACRIFICE!
Must Vacate Property

RECIPROCATING STEAM PUMPS

4—Simplex 24 x 6 x 16 Hot Oil
1—Duplex 10 x 3½ x 10 Hot Oil
1—Simplex 8 x 4 x 12
3—Duplex 7½ x 6 x 10 Water cooled
2—Duplex 7 x 4½ x 10
7—Duplex 6 x 4 x 6
4—Duplex 4½ x 2¾ x 4

STEEL STORAGE TANKS

1—10,000 gal. Horizontal 12' x 12'
3—10,000 gal. Horizontal 7' 6" x 33' 10"

BUBBLE AND OTHER TOWERS

1—3' x 50' x⅜", 17 trays, 24 C/1 Bubble Caps, welded seams
1—2' x 44' x ⅜", 31 trays, dished heads, welded seams
1—3' x 40' 6" x ¼", 15 trays, dished heads, welded seams
1—3' x 38' x ¼", 15 trays, dished heads, welded seams
1—6' x 50' 6" x ½", 18 trays, 64 C/1 Bubble Caps, welded seams
1—7' x 60' x ½", 24 trays, 86 C/1 Bubble Caps, welded seams
1—Clay Tower 10' x 35' 6" x ½", dished heads, welded seams
2—Tar Stripper 6' x 28' 6" x ¾", 1 tray, dished heads, welded seams
1—Stripper 2' 6" x 16' x 5/16", dished heads, welded seams
2—Side Stripper 3' x 12' 4" x 5/16", 4 trays, dished heads, welded seams
1—Vessel, 4' 11" x 13' 10" x 1", dished heads
3—Vaporizer 6' x 30' x ½", welded seams, dished heads
1—Vaporizer 6' x 30' x ¾", welded seams, dished heads
1—Vaporizer 5' x 24' x ¾", welded seams, dished heads

BRICK UNIT FURNACES

1—19' 2" x 24' 8" x 17' 6" x 24" Wall Thickness. 156 Plain carbon steel tubes, 4" OD x 22' x 7/16", 10 Zinc Natural Gas Burners. Complete with stack.
1—17' x 22' 5" x 24" Wall Thickness. 120 Plain carbon steel tubes 3" OD x 20' x ½", 6 Zinc Natural Gas Burners, Complete with stack.

PLUS HEAT EXCHANGERS, CONDENSER BOXES, COIL FURNACES, INSTRUMENTS.

Rush inquiries and request for complete listings to

BROWN-STRAUSS CORPORATION
P. O. Box 11
Galena Park, Texas
All listings subject to prior sale.

HELP WANTED

WANTED: Independent producer with over 20 years successful operations having very substantial production wants Field Production Superintendent capable of all field operations including drilling operations and productions in a section of Illinois Basin area. An excellent opportunity for the right man to get permanently located. Box C-447, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Man with background in geology, capable of directing and coordinating land and geological departments of independent oil company located in Oklahoma. In answering give training, experience, salary expected, and personal details. Box C-364, The Oil and Gas Journal, Tulsa, Oklahoma.

STRUCTURAL—Designers — Draftsmen — Openings for men experienced in design of Gas Processing Plants. 48 Hour Work—Good Pay—Air Conditioned Office. Fish Engineering Corp., 754 M & M Bldg., Houston, Texas. Phone C 4-5401.

WANTED: Experienced Surveyors for domestic gravity crews. $250.00 minimum salary for qualifying man. Box C-448, The Oil and Gas Journal.

WANTED: Oil and gas producing company operating in Gulf Coast needs experienced man to rework and review seismic data. Geological background preferred. Permanent location in main office. Salary open. All inquiries confidential. Address: Box C-420, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Industry Employment Service, 319 Castle Bldg., Tulsa, Okla., Mr. Robinson, Mgr., phone 4-5974. No fees to pay. Foreign service. Our client, a producing company in Persian Gulf area needs: (1) Assistant to General Manager. (2) Technical Assistant to General Manager. (3) Adm. Assistant to General Manager. (4) Division Pipeline Supt. (5) Office Assistant to pipeline supt. (6) Regulator Maintenance Engineer. (7) Meter Engineer. (8) Chief Production Clerk. (9) Assistant Reservoir Engineer. (10) Several Petroleum Engineers. (11) Several rotary drillers. (12) Several derrickmen. (13) Several combination cat-truck drivers. (14) Several American Chefs. (15) Reservoir Engineer in London. Only experienced men considered.

CHEMICAL ENGINEER to assist in treatment of salt water and corrosion control. Engineering degree required. Starting salary according to qualifications.

EAST TEXAS SALT WATER DISPOSAL COMPANY
Kilgore, Texas

WANTED

Production Superintendent for Western Kansas independent oil producer. To take charge of production and oversee drilling program (contractor's tools). Must have experience and knowledge of latest production practices, rotary and cable tool drilling. Car and modern house furnished. State salary desired. Only those with proper experience and good references need apply. Box C-444, The Oil and Gas Journal, Tulsa, Okla.

CONSTRUCTION INSPECTORS

Needed in connection with extensive construction program of gasoline plants, a large synthesis plant and pipe line projects. Applicants should be experienced in refinery, gasoline plant or pipe line construction and should be either graduate engineers, experienced inspectors, or have had considerable supervisory experience in related work. Salary commensurate with training and experience and educational qualifications in first letter. Address inquiries to Employment Office,

STANOLIND OIL AND GAS COMPANY
Box 591, Tulsa 2, Oklahoma.

SITUATIONS WANTED

SALES ENGINEER desires connection at Oklahoma City as representative for manufacturer of oil field equipment. Ten yrs. experience with major supply companies. Box C-226, The Oil and Gas Journal, Tulsa, Okla.

SEISMOLOGIST: Several years experience with major oil company in computing and interpretation. College graduate. Desires interpretive work in permanent location with major oil company. Box C-410, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST—Permian Basin and Rocky Mountain experience. Write Box C-438, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Drilling and Mud Engineer available for foreign employment. Some Spanish. Write Box C-453, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE petroleum engineer, experienced in production and related problems and some well completion, desires position in production department. Box C-454, The Oil and Gas Journal, Tulsa, Oklahoma.

DESIRE position as chief mud engineer—five years field experience in Gulf Coast and Mid-Continent well drilling and completion operations. Degree in Chemical Engineering. Box C-460, The Oil and Gas Journal, Tulsa, Oklahoma.

WISH to contact Oil or Drilling Executive who considers Quarter-Century Oilfield Accounting experience and mature judgment desirable rather than detrimental. Box C-459, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE PETROLEUM ENGINEER Executive assistant with large producing company. Experienced in technical administrative work in production. Desires position with major or established independent. Age 33. Prefers East or Middle West but will consider anywhere. Box C-445, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPING Draftsman: Will be available in thirty days. Now employed as squad leader on high pressure plant now under construction. Foreign employment acceptable. Box C-457, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION

SCHEDULED AIRLINE TRANSPORT PILOT desires change to private flying. Over 10 years experience without accident or violation. 4,330 hours multi-engine time with major airline. My record will warrant lowest insurance rates for dependable day, night or instrument executive travel.

Box C-433, The Oil and Gas Journal, Tulsa, Oklahoma

PERSONAL

WANTED to Contact — Lou Huddleson, Geologist, and Byers Edwards, Driller. Box 152, Litchfield, Illinois.

Application for Membership in the Diesel Engineers International Assn.
576 Newark Ave., Jersey City, N. J.
Name .....
Address .....
Reference .....

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908 Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on Request. Burkhart Printing & Stationery Company, 118 South Cincinnati, Tulsa 3, Oklahoma.

ROYALTIES

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry E. Wright, Wright Bldg., Farmington, New Mexico.

WE will buy producing or non-producing oil royalties. Send particulars. Standard Security Company, 115 Broadway, New York 6

LEASE AND DRILLING BLOCKS

HAVE oil leases on structure 650 feet. Can give offsets. Will take override. Also 1600 acre block for deeper well. Box 86, Casey, Illinois.

FOR SALE: 240 acre Lease, Christian County, Illinois. Three wells pumping 20 bbls. per day. Devonian 1900 Ft. For detailed information write: Wm. Marlowe, 1104 Fayette, Springfield, Illinois.

SOUTHEASTERN NEW MEXICO
Leases, royalties and drilling blocks. Grant Keyes, 311 White Bldg., Roswell, New Mexico.

1300 ACRES, Oklahoma hot spot, excellent geology, shallow drilling, well down 400 ft., $5,000 handles. L. H. Vinnedge, Country Campus, Huntsville, Texas.

ALBERTA, CANADA—640 acres, no restrictions, excepting coal. Not far from oil and gas production. Will lease for drilling. W. R. Dobbin, State Center, Iowa.

FOR SALE: Lea County, New Mexico, Oil and Gas Royalties, in active areas; Winkler County, Texas, Oil and Gas Royalty, near production. Harry Haynes, Grantville, Kansas.

FOR SALE: New 64 acre lease, N. T. Mills Survey, Shelby County, Texas, Arkansas Fuel Block. Located in heart of activity. Price, $10 per acre. Arkansas to start well at once. C. A. Parker, Box 451, Center, Texas.

320 ACRES in Kansas, with Geology; close to production (130 producers, 6 dry holes in pool); major companies having offset acreage. Will give big interest for coring sand or will consider small overriding interest for completed well. Box C-456, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 980 acre lease—200 sand acres depth 400' Bville Sand—cores show average 5000 bbl. recoverable per acre, small flood now on. 55 wells equipped, one 5½ Keystone, one nearly new 71 Spud Star Drilling Machine with tools—sell with or without tools. Two miles east, two south of Walnut, Kansas. Phone 12F2, Walnut.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois.
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

WANTED

GASOLINE PLANT WANTED FOR PURCHASE

10,000 to 25,000 gals. per day capacity. Send full particulars. All replies held confidential. Box C-421, The Oil and Gas Journal, Tulsa, Oklahoma.

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CALENDAR OF EVENTS

July

Third Annual Drilling Industry Safety Clinic, Baker Hotel, Dallas, July 6-7.

August

Appalachian Gas Measurement Short Course, eighth annual session, West Virginia University School of Mines, Morgantown, W. Va., August 30-September 1.

September

American Chemical Society, Division of Petroleum Chemistry, fall meeting, St. Louis, September 6-10.

The Instrument Society of America, third instrument conference and exhibit, Philadelphia Convention Hall, Philadelphia, September 13-17.

Pacific Coast Gas Association, annual convention, Hotel Casa del Rey, Santa Cruz, Calif., September 14-16.

American Petroleum Institute, Lubrication Committee, Hotel Traymore, Atlantic City, N. J., September 15-17.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 15-17.

Oklahoma Utilities Association, Gas Division, annual conference, Biltmore Hotel, Oklahoma City, September 17.

National Butane-Propane Association annual convention and trade exhibit, Congress Hotel, Chicago, Ill., September 20-22.

Independent Petroleum Association of America, annual meeting, Plaza Hotel, San Antonio, Tex., September 27-28.

October

American Society of Mechanical Engineers, petroleum division, Herring Hotel, Amarillo, Tex., October 3-6.

American Institute of Mining & Metallurgical Engineers, petroleum division, fall meeting, Adolphus Hotel, Dallas, October 4-6.

American Association of Petroleum Geologists, midyear meeting, technical session and 3-day field trip, William Penn Hotel, Pittsburgh, Pa., October 4-9.

California Natural Gasoline Association, twenty-fourth annual fall meeting, Ambassador Hotel, Los Angeles, Calif., October 8.

American Gas Association, annual convention, technical section, Ambassador Hotel, Atlantic City, October 4-9.

National Lubricating Grease Institute, sixteenth annual convention, Edgewater Beach Hotel, Chicago, October 11-13.

American Association of Oilwell Drilling Contractors, eighth annual meeting, Rice Hotel, Houston, October 11-13.

Texas Mid-Continent Oil and Gas Association, twenty-ninth annual meeting, Fort Worth, October 14-15.

American Institute of Mining and Metallurgical Engineers, petroleum division, Elks Club, Los Angeles, Calif., October 14-15.

Independent Natural Gas Association of America, annual meeting, Mayo Hotel, Tulsa, October 26.

November

American Society of Mechanical Engineers, fuels division, Greenbrier Hotel, White Sulphur Springs, W. Va., November 3-4.

Society of Automotive Engineers, fuels and lubricants division, Mayo Hotel, Tulsa, November 4-5.

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 8-11.

January 1949

Society of Automotive Engineers, annual meeting, Book-Cadillac Hotel, Detroit, Mich., January 10-14.

March 1949

New England Gas Association, Hotel Statler, Boston, March 24-25.

American Chemical Society, division of petroleum chemistry, spring meeting, San Francisco, March 27-April 1.

April 1949

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

NOMADS

Houston Nomads, second Monday of each month, The Houston Club, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

New York Nomads: Golf party, Sept. 21, at Baltusrol Country Club, N. J.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specfied, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as Tract 49E (NW¼SE¼) sec. 21 T. 43 N., R. 92 W., 6th P.M., Wyoming, 40.23 acres, and is within the known geologic structure of the Kirby Creek field undefined. Bids must be submitted on or before 1 p.m., Eastern Daylight Saving Time, July 21, 1948. Marion Clawson, Director.

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